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THE PREPARATION OF HIGH-SCHOOL TEACHERS: WHAT THEY DO SECURE AND WHAT THEY SHOULD SECURE

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In beginning to prepare this paper an attempt was made to secure through a questionnaire statistics showing the specific kind of training and experience which the high-school teachers have actually had in a number of typical states. The inadequate returns received made any exhaustive statistical study impossible. In only a few states has any attempt been made to gather such data. Some state superintendents replied in such a way as to indicate their probable feeling that such information would be entirely superfluous. But not until the statistics can be arrayed so as to show the glaring lack of uniformity, and how many teachers are below even moderate standards, can we expect to improve conditions. School boards and legislatures must be convinced through unequivocal testimony that woeful deficiencies exist often where the public boasts the most. About buildings and grounds the popular mind may have some intelligent opinions, but the ordinary school public does not discriminate between the expert teacher and the time-server. In the minds of the people, so long as friction is avoided, any teacher is considered a good teacher.

Failing to secure the adequate data concerning the actual preparation of teachers in service, I have investigated the laws of all the states to find the legal provisions concerning high-school

teaching. We should bear in mind that the actual preparation made by many, even a majority, is much better than that demanded by statutes. Local demands in the better cities are naturally in advance of legislation. Statutory provisions can seldom be secured until the wisdom of the requirements has been rather generally demonstrated. There is very little constructive legislation, especially school legislation. Legislative bodies in old, settled states are very conservative and merely reflect what they believe to be public opinion by confirming through statutory provisions what is well established in practice. Since they are usually so ignorant concerning educational needs, it is seldom possible to convince them of desirable legislation until long after various localities have proceeded way beyond the measures enacted. In new states, where traditions do not fetter and public opinion is little crystallized, much more constructive legislation is secured than in the older states.

As was believed, most of the states were found to be without legislation differentiating the high-school teacher from any other. In many school codes the term "high school" does not appear. This branch of the public-school system is a product of evolution which has come largely without legislative enactment. Localities developed at first simply "upper rooms," "higher departments," etc., and then bestowed the name "high school" without waiting permission or measurement by state authority.

Thus, singularly enough, in most states, although state certificates and diplomas are awarded to those who seek them, yet nobody is required to have them. Legally the one possessing the lowest grade of county or town certificate may teach in the highest grade of school. Many cities have secured state authority to regulate the certification of their own teachers, and usually have differentiated the certificates for the various grades of work. There is a crying need now for all states to make the differentiation. There is also great desirability of securing uniform laws in all the states so as to secure interstate comity in matters of certification.

A few pioneer states have secured desirable legislation relating to the certification of the various grades of teachers; and it

might be parenthetically observed that these states are already forging ahead in educational matters in a variety of ways.

LEGAL REQUIREMENTS FOR HIGH-SCHOOL CERTIFICATION

In the following paragraphs mention is made mainly of those states which have specific legislation determining the qualifications of high-school teachers. In general, where the laws simply state that all teachers must possess a legal license, and do not distinguish between elementary and secondary, no mention is made of the states. A few others are mentioned because it was possible to secure definite statistics concerning the teachers in service.

In Arizona only those holding the diploma of the Territorial Board of Education or the Board of Education of the Normal Schools of the Territory are eligible to teach in the high schools. Diplomas and state certificates from the other states may be recognized by the Territorial Board.

Colorado demands that all who teach in the high schools of that state shall take a county examination covering all the branches taught in the high school.

In the District of Columbia all high-school teachers must have a special certificate which qualifies the holder for that grade of work only.

In Connecticut there are 4,316 teachers in the state, of whom about 1,400 are normal-school graduates and about 400 graduates of colleges and universities. Most of these 400 are teaching in high schools. Inasmuch as there are only 66 high schools in the state, it is probably true that most of the teachers in the high schools are college or university graduates.

California has set the highest pace in the United States with reference to the qualifications for high-school teachers. Under statutory provisions, the State Board of Education grants all certificates for teaching in the high schools of the state. These may be obtained by examination or otherwise; but

no credentials shall be prescribed or allowed unless the same, in the judgment of said board, are the equivalent of a diploma of graduation from the University of California, and are satisfactory evidence that the holder thereof

has taken an amount of pedagogy equivalent to the minimum amount of pedagogy prescribed by the State Board of Education of this state, and include a recommendation for a high-school certificate from the faculty of the institution in which the pedagogical work shall have been taken.

California accepts the diplomas from all the universities belonging to the Association of American Universities, and also from fifteen other selected colleges and universities throughout the United States, provided the graduates have taken courses in the theory of education, or have had actual practice in teaching under supervision of the pedagogical faculty, equivalent to twelve hours per week for one half-year. Graduates of all the accepted colleges not belonging to the Association of American Universities must have completed subsequent to graduation one half-year of advanced academic or professional (pedagogical) work, in residence, either at the same institution or at some other accepted institution, or, in lieu of such graduate study, have taught with decided success, as regular teacher or as principal, at least twenty months in any reputable school, elementary or secondary. After July, 1906, at least one-third of the prescribed pedagogy shall consist of actual teaching in a well-equipped training school of secondary grade, directed by the department of education. After July 1, 1908, practice-teaching in a school of the grammar grade in connection with the California state normal schools will be accepted as an equivalent.

In Florida high schools cannot be recognized as such unless the teachers employed to give instruction therein are competent to teach the subjects required by the official course of study, and no school will be granted state aid unless such teachers are provided. While it is not now deemed practicable to require all such teachers to hold state certificates, it is recommended that preference always be given by boards to the holders of such certificates.

In Iowa, the most democratic and individualistic state in the Union, there is utter lack of uniformity. All depends upon local autonomy. The term "high school" does not appear in any legislative enactment, there is no definition of the term except that which each community chooses to give to it, and the state superintendent's office has no authority to regulate its courses or pre-

scribe qualifications for the teachers employed. Anyone possessing a third-grade county certificate may legally teach in any high school in the state. Notwithstanding this chaotic condition of educational legislation, the state has many high schools which are unexcelled anywhere. The wealth of the state, the life in small cities possessing a large rural population within a radius of a few miles of each, the uniformity of nationality, the lack of slums and factory districts, give natural advantages which would easily give it, with proper legislation, the greatest school system of the United States. The state is suffering because of its prejudices against any form of centralization of power.

There are in the state about 650 graded schools—which call themselves high schools. Nearly all of these might become high schools if the proper teaching force were employed, proper equipment secured, and a little effort made to enlist the interest of the rural population in the immediate vicinity. This has been demonstrated in many small villages where they have become awake to the possibilities. As it is, not more than 250, judged by proper standards, have any right to be called high schools. There are 185 schools on the accredited list of the state university. In these there are 879 teachers, including the principals and superintendents. Of these, 453 are university or college graduates, 189 have had from one to three years in some college, 84 are normal-school graduates only. The remainder have had very little academic or professional training. Regrettable as it is, one in fourteen, or one teacher in every third accredited school, has had no institutional training beyond that afforded by the high school, and that usually in the home school. Of the total number employed, 332 had been teaching ten years or more, 265 had five or more years' experience, while 61 were beginners. Statistics from all the schools which have any claim to the title of high school would show a much smaller proportion of college graduates and many more raw recruits.

Louisiana definitely recognizes high schools and makes an attempt to secure the best quality of teachers for these schools. In 1892 a law was passed imposing a penalty on all local school

boards who failed to give preference to state normal-school graduates and graduates of colleges when employing teachers.

In Maine, according to the laws of 1904, the highest grade of state certificate is necessary to teach in any free high school of the state. Candidates who are college graduates, or graduates from the college preparatory course or its equivalent in a first-class academy or high school, and whose average rank is 90 and whose rank in any subject is not less than 70, will receive a certificate of the highest grade. Others who are not graduates, but whose rank is exceptionally high, who can teach high-school subjects, including at least one ancient and one modern language, and who have taught successfully in high school, may receive a certificate of highest grade.

Massachusetts has 262 high schools, requiring 1,820 teachers. Although the laws do not specify any particular grade of certificate, the sentiment of the people has secured a high grade of teachers. Of the teachers in the high schools, 1,410 are college graduates. It is safe to assume that the remaining 410 are at least normal-school graduates. Only 98 have taught for less than one year.

Minnesota requires that any teacher employed in a state high school must hold a first-grade professional state certificate, issued either on a collegiate diploma or upon examination. However, the state superintendent may issue a permit, valid for one year, to high-school teachers who have not had the necessary teaching experience in Minnesota to entitle them to a first-grade professional certificate, but who are otherwise qualified. A first-grade state professional certificate may be obtained by graduates from the University of Minnesota, or from another university or college of equal rank. The applicant must first have secured a state first-grade certificate, and must also have taught with success not less than nine months in a public school in a state. Applicants who are not graduates must have the teaching experience and the first-grade certificate noted above, and in addition will be required to pass a successful examination in the following branches: astronomy, bookkeeping, botany, chemistry, English literature, general history, geology, history of education, logic, moral phi-

losophy, political economy, psychology, rhetoric, school economy, school law, solid geometry, trigonometry, zoölogy. A state professional certificate of the first grade is valid to teach in any public school of the state, including high schools. It is made valid for periods ranging from one year to life, according to the merit of the holder. A certificate of graduation from the department of pedagogy¹ at the state university entitles the holder to teach in any public school in the state for a period of two years immediately following graduation. At the end of such period the certificate may be indorsed by the president of the state university and the state superintendent of public instruction, when it becomes a life-certificate. It is of interest to note that graduates of Minnesota state normal schools, or other normal schools of equal rank outside the state, are not entitled to teach in the high schools. They receive first temporary and then life-certificates, which are valid in any public school in the state below the high-school department. The state teachers' first-grade certificate, valid for five years to teach in any public school in the state, will not qualify the holder to teach in the high school, or even for the principaship of a state graded school. These rigid regulations have raised the quality of the teaching force and teachers' salaries in Minnesota very materially.

According to figures furnished by State High-School Inspector Aiton, there are 192 high schools in the state, employing 870 teachers, including the superintendents. Of these, 733 are graduates of a college or a university, and only 56 are graduates of a normal school. It is well known that very generous state aid is provided whereby each standard high school receives \$1,500 from the state treasury. This state aid affords better salaries and attracts better teachers. The state aid and the high standard of scholarship demanded have put Minnesota in the very front rank educationally.

In Montana it is provided that no person shall be employed as a teacher in a high school, or as the principal teacher in a school of more than two departments, who is not the holder of a

¹ The above is taken from the law as passed in 1895. The state university now has a college of education.

professional county certificate or the holder of a life state diploma issued by the State Board of Education of Montana, or who is not a graduate of some reputable university, college, or normal school.

New Jersey provides that all teachers in the high schools must possess either a first-grade county certificate, a first-grade city certificate, or a state certificate. The first-grade certificate requires an examination in the theory and practice of teaching, New Jersey school law, the history of education, and general history, in addition to the usual branches required for a second-grade certificate. The lowest grade of state certificate involves an examination equivalent to that required of the first-grade county certificate, and in addition thereto psychology, plane and solid geometry, literature, botany, and free-hand drawing, or, in place of one or more of these subjects, such other subjects as the State Board of Examiners may require. This lowest or third-grade state certificate is valid for seven years.

In Nevada no one may teach in a high school who does not possess either the county high-school certificate, which is good for four years, or a state certificate granted from the Nevada State Normal School, or by a reputable university or college from which the bachelor of arts degree has been received. Pedagogy is also required in the course. The state life-diploma also is a valid license to teach in any public high school.

New York will not allow teachers to hold positions in the high schools unless possessed of some specified grade of certificate. At the present time they accept for high-school teaching what are known as the training-school certificate, the state certificate, the state special certificate, the normal diploma, the college graduate certificate, and the college graduate professional certificate. College graduates are given a provisional certificate valid for two years. If they pass an examination upon psychology, history of education, principles of education, methods of teaching, during those two years they may be awarded a permanent certificate. Those college graduates who have completed a course in pedagogy outlined by the state receive a certificate valid for three years, at the end of which the same may be indorsed by

the state commissioner of education and made a life-certificate. In New York 39 per cent. of the high-school teachers and 43 per cent. of the principals are college graduates.

Nebraska has taken a most important step toward providing competent teachers for the high schools of that state. On and after September 1, 1907, no person shall be granted a certificate to teach in the high-school department of any high-school district, or in the high-school department of any city school district in the state, who is not a graduate from a regular four-year course of a college or university, or a graduate from the advanced course of a college, university, or normal school in the state authorized by law to grant teachers' certificates, or who does not hold a professional state certificate obtained from the state superintendent on examination. During the interim between now and August, 1907, high-school principals and city superintendents may obtain a first-grade county certificate, valid for three years, which will make them eligible to teach in any high-school district or city school district until September 1, 1910.

Ohio, which long lagged behind in the matter of educational legislation, has probably outdone all other states in several respects. One of these is in accurately defining high schools and colleges. Then, to be consistent, the qualifications of high-school teachers have also been thoroughly defined. All teachers in the high schools must possess some form of high-school certificate. This certificate may be issued either by the county or by the state. All county high-school certificates must include the usual branches required for a third-grade certificate, and in addition literature, general history, algebra, physics, physiology, and four branches from the following list: Latin, German, rhetoric, civil government, geometry, physical geography, botany, and chemistry. In addition, the certificate must show that the candidate "possesses an adequate knowledge of the theory and practice of teaching." Special high-school certificates are issued, valid only for the branches mentioned in the certificate; but it is further provided that no person be employed as a special teacher of music, drawing, painting, penmanship, gymnastics, German, French, the commercial industrial branches, in any elementary or high school,

who has not a certificate of good moral character and a certificate of proficiency in the theory and practice of teaching. Cities which have the power to grant certificates must observe similar conditions. The state certificates are, of course, of a still higher grade.

Texas allows cities of five hundred or more school population to establish their own boards of examiners, which issue different classes of certificates corresponding to the grade of work to be taught. The high-school certificate is a prerequisite to teaching in the high school, and is valid for high-school work only. State certificates are recognized by these boards. Diplomas from the state university which certify to the requisite amount of pedagogical work are valid as state certificates.

In Washington, D. C., certificates are limited to special grades of schools. The certificates are issued by the city. Only a special certificate will be accepted for high-school work. Graduation from the Washington normal schools and other approved normal schools is recognized toward certification.

In Wisconsin all teachers must have some form of state certificate to be qualified to teach in the high schools of the state. The state certificates are of two grades: the limited five-year certificate, and the life-certificate. These certificates may be gained by examination or through counter-signature of state normal-school diplomas, college diplomas, or university diplomas. A diploma granted upon the completion of a collegiate course² in the State University of Wisconsin or from the full course of any Wisconsin normal school is valid as a temporary certificate for one year, and after counter-signature by the state superintendent is validated as a life state certificate. Diplomas granted by other colleges and normal schools, within and without the state, whose courses of study are equivalent to those recognized in Wisconsin, may be recognized in the same way as those issued in the state. Life state certificates issued by other states may be countersigned by the state superintendent of Wisconsin upon the recommendation of the State Board of Examiners, and thereby become life-certificates in the state. The diploma granted upon the comple-

²The course must include a year of work in education.

tion of the elementary course of the state normal schools qualifies the holder only for positions as assistant in four-year high schools or as principal of three-year high schools. All principals and all teachers of four-year high-school courses must possess an equivalent of the life state certificate. Assistants may secure a special state certificate by first securing a county certificate in the county where they desire to teach, and in addition passing a state examination upon all branches which they teach and which are not included in the county certificate. Superintendents must all possess the unlimited state certificate. It will be thus seen that the entrance to teaching in the high schools of Wisconsin is very carefully guarded. The rigid provisions have raised the qualification for teaching in Wisconsin very materially.

The following figures show the qualifications of teachers in the Wisconsin high schools for 1903-4:³

Attended the Wisconsin State University.....	94
Attended other colleges	45
	139
Attended a normal school	71
Hold life-certificates	3
	74
Total	213

TABLE SHOWING NUMBER OF TEACHERS, INCLUDING PRINCIPALS IN THE FOUR-YEAR FREE HIGH SCHOOLS, WITH HIGHEST SCHOOL ATTENDED

Attended the Wisconsin State University	229
Attended universities and colleges outside the state	85
Attended Beloit College	30
Attended Lawrence University	40
Attended Ripon	13
Attended Milton College	3
Attended Wisconsin normal schools	268
Hold licenses and certificates of approval or state certificates on examination	131
Total	799

³Eleventh Biennial Report of the Department of Public Instruction, 1904, p. 85.

CONCERNING QUALIFICATIONS OF PRINCIPALS OF THREE-YEAR HIGH SCHOOLS IN
THE YEAR 1903-4

- 23 attended a normal school and hold normal-school diplomas.
- 3 attended a normal school and hold elementary certificates.
- 5 hold life-certificates.
- 1 holds a limited state certificate.
- 1 holds a university diploma.

PROFESSIONAL REQUIREMENTS

Statistics concerning the actual amount of professional training of teachers are even more difficult to secure than those concerning academic qualifications. In those states where no differentiation is made between the licenses required of elementary teachers and high-school teachers there is little incentive to gain high-class certificates. In Iowa the third-grade certificate is the only legal requirement, and a comparatively small number apply for state certificates. Now that the county certificate will be valid in any county in the state the number of state certificates will doubtless be still further decreased. The main incentive to secure the state certificate is the fact that the state certificate is valid in any county of the state. It is also desirable in many states when teachers move and find the state certificate necessary in the new state.

County certificates in all states include some test on the theory and art of teaching, or didactics, as it is frequently called. But most county examinations in the theory of education are a perfect farce. The questions seldom require any technical knowledge of pedagogy. Anyone with an ounce of common-sense could answer them correctly. Most frequently, when books are prescribed in the reading circle or by the superintendent as a basis for the examination, some general book, like *Jean Mitchell's School* or the *Evolution of Dodd*, is selected. While these are good enough in their way, and would afford a few hours' pleasant reading and stimulate the better emotions, yet they give no real principles upon which to base a theory of education. Even in the state examinations the primer of the subject has scarcely been touched. In a few states definite syllabuses are prepared, giving an outline of the subjects, particular books to be read, etc.

This plan gives the candidates a definite plan of work, and sometimes happily convinces them that the surest and soundest method of preparing is to go to some good institution where they can receive proper training.

Without exception, all states include some professional work in the examinations for life-certificates. A few (New York, for example) grant provisional or temporary state certificates to college graduates, even though they have not included professional work in their course. Thus all who secure the life state certificates have gained some insight into pedagogical subjects. The subjects prescribed vary greatly, though the history of education and psychology are usually included. As indicated above, the amount required is very meager. Qualitatively it is usually antiquated.

In most states which validate college diplomas as state certificates a year's daily work in psychology and education or a year in the latter following half a year in the former is required. Even there the professional work required when the certificate is gained by examination is very meager. It is in no way the equivalent of the work done in the year or more in college. Any college graduate could prepare for the professional examination ordinarily given through two weeks' continuous careful reading of some elementary texts. This is entirely wrong and very inconsistent. The examinations in other subjects, like botany, physics, and mathematics, are put upon a technical basis, and generally the questions are modern in nature. But the professional examinations are decidedly irritating to modern teachers of those subjects. Even an imperfect knowledge of the primer of the history of education, psychology, and of method would enable the candidate to pass.

New York state has taken an advanced stand on the matter of professional training and prescribes the following work for the state certificate, in addition to graduation from college: general and educational psychology, ninety recitation hours; history and principles of education, ninety hours; methods in teaching, sixty hours; observation, twenty hours. This would make a total of about seven hours a week for a year, or fourteen semester

units. As previously mentioned, graduates may receive a provisional certificate for two years, if they have not had the professional work; but before it can be made a permanent certificate they must pass an examination upon the professional work indicated. Those who secure state certificates by examination are required to pass a rigid examination in the professional subjects. This examination is made thorough, if we are to judge from the syllabus issued by the state department. The syllabus contains a good outline of all the subjects and a fine list of references. It is thoroughly technical and academic in character, and it sets a high pace for all other states. Several universities in New York, and doubtless several colleges, have arranged their work in the department of education to correspond with the state requirements. I have at hand outlines of the work as prescribed at Cornell, Syracuse, and Columbia.

All who receive the Teachers College diploma at Columbia must have completed three semester units of psychology, three units of educational psychology, three units in the history and principles of education, and three units in the theory and practice of teaching some special subject. Those who receive a degree from the College of Education in Chicago are required to include for graduation eight majors in education, including the history of education, principles of education, educational psychology, and a course in general psychology.

The University of Wisconsin, whose diplomas are recognized as state certificates, provided prerequisite professional work has been included, requires ten semester units, three of which in psychology, three units in either the history or principles of education or advanced educational psychology, and four units which may be elected from either the department of philosophy or the department of education.

The state of Texas recognizes the diploma from the University of Texas, provided the prerequisite professional training has been included. The university prescribes as the professional work two semester units of school management, four units in the methods and principles of teaching, four units in the psychology of education, two units in the psychology of development, and six elective hours in the department of education.

California not only accredits the work of the university toward the state certificate, but will not grant a certificate to teachers in the high schools unless the candidate is a graduate of the University of California or an approved equivalent institution. In addition to the work required for the bachelor's degree, the candidate must have completed at least one year of graduate study in the University of California or an approved university. This year of graduate study shall include one half-year of advanced academic study, part of the time at least being devoted to one or more of the subjects taught in the high-school, and the remainder of the time must be spent in a well-equipped training school of secondary grade, directed by the department of education of the approved university. This represents the high-water mark of requirements both academic and professional for teaching in the high schools in the United States. The professional work required by the department of education in the University of California includes three semester hours of the history of education, three hours in a study of secondary education, two hours of methods, and four hours in practice-teaching. The department urges the study of philosophy and psychology as prerequisites, but does not require them.

The Teachers College of the University of Missouri, whose diplomas are recognized as life state certificates, requires candidates to complete three semester hours of experimental psychology, and twenty-four hours of education. The work in education must include three hours in the history of education, three hours in the theory of teaching, and from three to nine hours of practice-teaching. In addition to the psychology and education requirements, each candidate must complete at least eighteen semester hours in each subject in which the special certificate is sought. This gives almost ideal requirements for the state certificate to teach in high schools.

THE UNIVERSITY AND THE COLLEGE AS TRAINING SCHOOLS FOR HIGH-SCHOOL TEACHERS

Ever since secondary schools were first founded the university and the college have been training schools which have furnished the majority of their teachers. The German secondary

schools have always been manned by the best products of the German universities, and that tells the story of Germany's enviable position in secondary education. Since the time of the founding of the "great public schools" in England, Oxford and Cambridge have furnished all the teachers for them. Though they have not had the professional training of Germany's matchless schoolmasters, yet they have been men of fine culture and broad training. In America, Harvard and Yale in New England, and William and Mary in the South, at once began to place their graduates in the "grammar schools," like the Boston Public Latin School, and later in the academies. The influence of these men, representing the best culture of the times, has had a marked effect. In the secondary school, where inspiration and outlook are so essential to the life of the school, the breadth of view which comes from college life is indispensable. It is lamentably true that these zealous young men, and more recently women, have often been woefully lacking in pedagogical insight, but their scholarship and vital touch with life have been more valuable than the mere drillmaster's arts.

With the advent of the normal school, in 1839, an attempt was made to correct the deficiency in the pedagogical training of teachers. Naturally the pendulum swung a long way in the other direction, and methods and devices became a fetish. The normal schools went to seed on methods. Devices and details were eagerly pursued when principles should have been sought. The drillmaster became the ideal class-teacher, and the machine method-master the ideal superintendent. Normal-school graduates everywhere in the eighties and nineties began to teach in the high schools and to occupy the superintendencies. When I was graduated from a Wisconsin normal school in 1890, graduates did not think of looking for a grade position, unless they happened to live in a large city. High-school positions and good principalships and superintendencies were readily secured by the men. Similar conditions obtained in all adjoining states. At the present time conditions are so changed that it is only in exceptional cases that the graduate of a normal school begins in a high school. Occasionally he begins in a small high school which does

two or three years of high-school work. But usually the normal graduate commences in the grades, or goes to some university to complete work for graduation. This makes quite an ideal course of training; for at the normal schools he becomes imbued with the teaching spirit, and his university work gives him a scholastic baptism. Happily a new era has dawned in the normal schools with reference to methods. They have been touched by the new spirit in psychology and child-study, and are now, in general, seeking principles instead of devices.

The normal school, generally speaking, is not fitted to train high-school teachers. There are, of course, some schools which are much better equipped than others. There are some large and aspiring ones which are lengthening their courses, providing laboratory and library facilities to such an extent that they are better able to accomplish this work than the one-horse colleges; but the organization of a normal school must ever be such as to limit its function to the training of elementary teachers. Just as soon as it transcends this function it ceases to be in the highest degree effective in training elementary teachers, for which they have all been designed. It then becomes an additional state college or university—a duplication which most states do not desire.

The high-school teacher needs above all a broad outlook upon life, deep and thorough scholarship, and liberality of attitude which is best promoted by the university atmosphere. The normal school, with its ten-weeks' courses and ceaseless flitting-about, its many exercises per day, the constant emphasis upon method rather than content, the excessive attention to the little details such as are largely necessary in training the immature and those who are to deal with details of elementary work, militates against sound scholarship and liberality of mind. Most normal schools are so organized that students are admitted from the country school. These students are in constant contact with the most advanced. This necessitates leveling down to the plane of the most immature.

The only place where the science of education can be adequately taught is in the university or in the few colleges. The

institution must be equipped with a department devoted solely to education. No man straddling the chairs of philosophy, psychology, logic, ethics, and education can even have come to an independent educational philosophy, much less develop it in others. One burdened with several chairs and all the subjects within each may have students recite from textbooks, but it is lame teaching. The work in education cannot even be done well where one man is required to cover all subjects within the department.

President G. Stanley Hall says:

I think preparation of secondary teachers should never be permitted in a normal school where primary teachers are trained, but should be entirely given over to the university. This is essentially the case in Germany. . . . I think there is very little in common either in methods or matter in the curriculum proper for these classes of teachers.⁴

Professor DeGarmo says:

The most obvious distinction between the normal school and the university as a training ground for secondary teachers is that the normal school is obliged by its conditions, its primary aims, and its traditions to devote its chief energies to the preparation of elementary teachers. Only in a large and general way can it devote more than a fraction of its attention to the training of teachers for secondary schools.⁵

These differences he regards as so fundamentally opposed in nature that any attempt to unite the two will result in the decreased efficiency of the normal school.

President Van Liew, who speaks on the question after much experience as a normal-school man, and who is a scholar of distinction, says:

The weakness of the normal school, especially in the matter of training secondary teachers, lies in its inability to supply large general culture. So far as secondary teachers are concerned, at least, it ought not to try it.⁶

Charles B. Gilbert wrote:

The ideal place for the training of secondary teachers is a teachers' college of some sort attached to a university as a co-ordinate part, utilizing all the scholarly advantages of the university and adding the special training needed to make teachers.⁷

President Thompson, of Ohio State University, in discussing

⁴ *Fourth Yearbook*, I, p. 84.

⁶ *Ibid.*, p. 92.

⁵ *Ibid.*, p. 89.

⁷ *Ibid.*, p. 102.

the great need of developing teachers' colleges in connection with the universities, said :

I think it goes without discussion that for the cause of education the teachers in our high schools should have the university spirit, and that they ought to have college training. This argument is based not so much upon the particular subject studied as upon the superior value of association with university faculties and university methods. Our high schools have suffered for lack of such teachers on the one hand, and on the other hand they have suffered from having too many teachers whose normal-school training or other education has not been with a view to training them for high-school work. It would seem, therefore, that in some form the teachers' college ought to be a part of the university organization.⁸

In the same meeting President Babcock, of Arizona, who has also had long experience in the Minnesota and California systems, said :

If the normal schools are going to train their students for grade work frankly, honestly, without any pretensions or conceit, those who desire to go on for high-school work must go to the university, to the colleges or teachers' colleges, which provide that sort of training.⁹

My own belief in the necessity of university training for high-school teaching was definitely developed before I became a member of a university faculty. Immediately upon graduation from one of the best normal schools in the country I became a high-school principal. I soon came to the belief, and many times expressed it, that normal training was insufficient preparation for such work. At the earliest possible moment I supplemented my training by a university course before re-entering the public-school service. Later I was for two years a member of the faculty in the same normal school. I believe my colleagues there will bear witness that I continually urged that our graduates ought to complete a university course before beginning high-school work. That the function of the university and the normal school must be different, I believed then as firmly as I do now.¹⁰

⁸ *Transactions and Proceedings of the National Association of State Universities, 1904*, p. 43.

⁹ *Ibid.*, p. 64.

¹⁰ My views of that time may be seen in an article in *Education*, May and June, 1898.

The experience of the New York State Normal College ought to be valuable in determining the suitability of the normal school or the college in preparing high-school teachers. The Normal College was granted a charter in 1890, empowering it to confer degrees in pedagogy, hoping thereby to attract college and university graduates who would spend at least a year in post-graduate study along strictly professional lines. Those expectations have not been realized. During one year forty such students were in residence, but the number has declined because pedagogical courses in the meantime have been developed in colleges and universities.

It was thought, too, at the time when the Normal College was chartered, that the graduates from the classical courses offered at the Normal College would find positions in the high schools, but the demand for teachers of more liberal culture has increased so much since 1890 that probably not more than one-half of the graduates have found employment in the secondary schools of the state. Consequently, the Normal College has not been able to meet the expectations or the demands of the state for college-bred teachers who have a proper knowledge of the science of education and the principles of pedagogy. . . . The belief of educators, philosophers, and educated people alike has crystallized into the conviction that teachers who are to be employed in the high school, normal school's, for teachers' training classes, for teachers and as instructors in manual training, domestic science, art, and other special subjects, should be college graduates with a thorough knowledge of the general principles of pedagogy, and the most advanced and most valuable methods of teaching their specialities.¹¹

The report points out that the normal schools are not equipped for preparing teachers for the high schools. In consequence, all of the elementary work at the State Normal College has been abolished, the requirements for admission have been made equal to those maintained in eastern colleges, and a four-year course of study in the liberal arts in pedagogics has been established.

Though there are many splendid teachers in our best high schools and a few in the smaller schools, yet the fact remains that our boys and girls in the most critical period of their lives are in control of immature, inexperienced youngsters. Some of these youths have large native ability and special potential teaching qualities, and ultimately become good teachers. Some have good

¹¹ *Annual Report, Education Department, p. 274.*

academic training also, and after expensive experimenting upon the children become first-class teachers. Their enthusiasm, vigor, cheerfulness, and general culture are all qualities that we ought to retain; but the fact remains that our optimism regarding secondary-school teaching must come from viewing the select few than from conditions as a whole.

The greatest defect in our American schools is the lack of uniformity of requirements for teaching. Under our ultra-democratic notions some properly fitted teachers enter the work, but they are obliged to come into competition with a majority who are unprepared. Frequently, because of ignorance on the part of boards, and often because of nepotism, the incompetent, cheap teachers drive the worthier ones out of the market, or force them down to the lower level of salaries. The inadequate compensation is the great deterrent which keeps thousands of the most promising from ever entering into the undesirable competition.

We are greatly in need of legislation in all states which will permit only the absolutely well trained to enter the ranks. The cry frequently raised against such legislation, that the schools would be without teachers, is sheer nonsense. When our colleges and universities can find such abundant supplies of doctors of philosophy for every subordinate instructorship, there need be no difficulty in securing all the adequately prepared teachers necessary, if living salaries are offered. Legislation eliminating the "infit" would raise the salaries. In all those states having laws requiring teachers to possess high-grade certificates the salaries are demonstrably above the average paid in those states without such protective legislation.

Although the statutory provisions are very insufficient in requiring adequate preparation for teaching in the high schools, yet many cities have made regulations which require all to be college graduates. In Fort Dodge, Iowa, for example, all are required to be college graduates and to have had two years' experience. There are hundreds of cities large and small where either definite legislation to this effect has been enacted, or else the practice has become local common law.

The North Central Association of Colleges and Secondary Schools has had a very marked effect in raising standards of teaching in the high schools. No school can become accredited unless all the teachers are college graduates or the equivalent. One high-school inspector wrote me:

We have about fifty high schools on the North Central list, and many are trying for admission. This requirement has been most wholesome in its effect on our schools, and has done more than any other one provision in our recent educational history. Of course, there has been a gradual increase in the number of college graduates occupying high-school positions, but it has simply been the law of evolution, a sort of triumph of the fittest. The normal school . . . has in the past filled a good many positions, and many of the school authorities have been unable to distinguish between them and graduates of other institutions. The influence of the North Central Association, the increased efficiency of our denominational colleges, and the gradual increase of salaries have all contrived to drive them [the normal-school graduates] out of the field of the best schools except in a few isolated cases.

STANDARDS IN GERMANY

The training required of the German secondary-school teacher is much more ideal than that demanded of teachers in the same kind of school-work in the United States. In Germany advanced, critical, academic, and professional scholarship are absolute prerequisites to teaching in the secondary schools. No deviations are allowed. No mere pull with the board will suffice; for the matter does not rest with the local board, but with the state authorities.

In Germany all secondary-school teachers are university trained, as they ought to be everywhere. The candidates for a position in the secondary schools must have had at least three years of university study before being admitted to the examination for the state certificate, which all must possess. This means a high grade of academic scholarship, since university entrance is conditioned upon graduation from the secondary schools, which is fully equivalent to the completion of the sophomore year in our very best colleges. Therefore every teacher in the German secondary schools has done work equivalent to that required for our masters' degrees. As a matter of fact, the majority of German secondary-school teachers have studied more than three

years in a university. The majority are possessors of the doctorate degree, which cannot be secured with less than three years of university work, and usually requires four or five. Each teacher is required to present a major line of work and a minor. The examination in the minor must reveal complete comprehension and mastery of the subject far beyond any limits to which it is taught in the secondary school. Even with this preparation they are not permitted to give instruction in that branch in the advanced classes of the school. In the major subject, not only thorough mastery is required, but there must be evidence of critical and exhaustive research to the extent of becoming, not only a master, but an authority. A thesis in the major must reveal independence of method, acquaintance with the history and literature of the subject. The thesis and the examination are intended to test the candidate's knowledge of its philosophic aspects. In a general way we may say that the academic training of the German secondary-school teacher is quite on a par with the attainments of instructors in our best colleges, and the majority are comparable with well-seasoned college professors. Promotions are so slow there that the majority are about thirty years of age before securing permanent positions.

Knowledge of the subject-matter, however, is happily deemed insufficient for any German teacher. All teachers in the secondary schools are required to include psychology, philosophy, and theoretical pedagogy in the state examination. In addition, they must take a two-year course of professional training. This can be begun only after passing the state examination.

STANDARDS SUGGESTED FOR AMERICAN SCHOOLS

As minimum requirements it seems fair to ask that all teachers who enter high-school work should have had at least the equivalent of a college education. To accept less is to place the schools in charge of immature, unscholarly boys and girls and undeserving place-hunters. The high schools are the people's colleges, and should ever remain centers of liberal culture. That they can never be when in charge of teachers who have never learned to love scholarship. I am of the firm belief that only in

exceptional instances should teachers be permitted to teach in our high schools who have not actually studied in a standard higher institution. Those who preferred to acquire certificates through examination only should be required to pass most searching examinations. What if an occasional deserving individual were thus debarred? In most states the right to practice medicine is withheld from all except those who have studied in a reputable medical college. No mere private study and cramming for the examinations will suffice. The right to enter the examination, as in Germany, is conditioned by previous study for a term of years in a reputable institution. The theory is—and perfectly sound—that no one can gain adequate knowledge of modern methods of medicine without coming directly in contact with properly equipped laboratories and skilled teachers. Through private study of books the diligent might accomplish much, but the risks to society are too great to admit of trifling. Hence the necessity of measures which will protect society. Many states have similar protective legislation in the profession of law.

Are the needs not as great in teaching? The results of mistakes are not always so immediately apparent to the public in education as in medicine, but to the specialist in education they cannot be hidden. Why intrust the most precious possessions of the human race to the ruthless hands of ignorant beginners and confirmed quacks and charlatans? Every poor teacher helps to spoil scores of children every year, while the quack doctor of medicine occasionally harms an individual. The malpractice of the inexpert teacher is tenfold more harmful to society than that of the quack doctor. The teacher guilty of malpractice dwarfs, distorts, and poisons the mind and body of the budding, developing child; while the quack doctor merely fails to cure bodily disease. The quack teacher sows the seeds of disease; the quack doctor simply fails to cure.

From the professional side the minimum requirments should be at least one full year of daily work in education subsequent to a half-year of work in psychology. It would be still better, and not excessive, to demand that one-sixth of the college course

should be given to educational and philosophical subjects. This should be so distributed as to give about one half-year daily to general psychology, a full year daily to the principles of education and child-study, and the remainder of the time to the history of education, methods, school systems, etc. If one-fourth of the 120 units of the college course could be professional, the following arrangement would be desirable: psychology, 6 semester hours; principles of education, 6; child-study, 2; methods, 4; history of education, 4; secondary education, 4; observation and practice, 4.

The Germans are wise in requiring actual residential study in a university as a prerequisite to teaching in the secondary schools. (Normal-school study is required of all who teach in the elementary schools.) It is practically impossible for one to gain modern ideas of scholarship without institutional training. Even if possible, other methods are too uncertain and expensive. Private study may give one certain book facts, but nothing can be substituted for the laboratory methods of the modern institution. The teacher who is to teach classes by modern laboratory methods must first have been through the laboratory work himself. The teacher who is to teach literary and historical subjects must know what libraries contain and how to utilize them. This can be secured only through contact with them. It is preposterous to think that men may be intrusted to equip laboratories and libraries when they know nothing of them. Yet such things are permitted and encouraged by our inadequate protective legislation.

Hon. J. Sterling Morton eloquently emphasized the importance of professional training for teachers when he said:

We demand for Nebraska educated educators. We demand professionally trained teachers, men and women of irreproachable character and well-tested abilities. We demand from our legislature laws raising the standard of the profession and exalting the office of the teacher. As the doctor of medicine or the practitioner of law is only admitted within the pale of his calling upon the production of his parchment or certificate, so the applicant for the position of instructor in our primary and other schools should be required by law to first produce his diploma, his authority to teach, from the normal schools.

We call no uneducated quack or charlatan to perform surgery upon the

bodies of our children, lest they may be deformed, crippled, or maimed physically all their lives. Let us take equal care that we intrust the development of the mental faculties to skilled instructors of magnanimous character, that the mentalities of our children may not be mutilated, deformed, and crippled to halt and limp through all the centuries of their never-ending lives. The deformed body will die, and be forever put out of sight under the ground, but a mind made monstrous by bad teaching dies not, but stalks forever among the ages, an immortal mockery of the divine image.

SCIENCE FOR CULTURE¹

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If there is anything the matter with science-teaching, one may be very hopeful that the difficulty will be cured when he considers the number of associations and clubs of science teachers formed to discuss plans for improving present conditions.

My subject needs a little definition.

Probably everyone who is teaching science is attempting to cultivate something. One aims at accuracy, skill, honesty of thought, discipline; another aims to cultivate imagination, power of generalizing, information, etc.

I have no disagreement with either party, except that they ought not to exist as parties. They should combine. The different departments of education should work toward one end. Certainly it cannot be the duty of one department to tear down what another constructs.

It is my purpose to speak of culture as we generally use the term when we speak of culture courses, liberal education, etc.

No one needs imagination more than the investigator, and no one has a better opportunity to cultivate it than the teacher of physics. The scientist and the humanist have not conflicting duties—indeed, there is no occasion to make a distinction between them. Humanism which is not scientific and science which is not humanistic are worthless.

Professor Cooke says: "Science culture differs in its methods from the old classical culture, but it has the same spirit and the same object."²

Professor Burr, speaking of the fundamental idea of the humanists, says:

¹ Paper read at the annual meeting of the Central Association of Science and Mathematics Teachers, University of Chicago, November 30, 1906.

² J. P. Cooke, *Science Culture*, p. 20.

It was their open purpose in which they gloried to treat of things as they actually existed, to get as near to the life of the community as the best knowledge would bring them; in other words, to touch human life intimately and at the greatest possible number of points.³

Let it be conceded that it is very desirable to cultivate accuracy, self-dependence, mental honesty, etc. There is no short-cut, no royal road, to these results. Such fruits do not come out of forty laboratory exercises. They are a slow growth of many years. Quantitative work simplified, made direct, and put in its proper sequence with qualitative work, may profitably occupy, say, one quarter of the effort of a high-school pupil in physics. But science is something more than measurement. To be sure, when men began to measure, they took great strides forward; but it is equally true that research comes to a standstill when information and imagination are wanting. The chief difficulty with science-teaching today, both in the high school and in the college, is that we do not give sufficient information.

Culture courses, or information courses, are often spoken of scornfully as a "smattering of all the 'ologies."

We have the mistaken idea that we can cut a clean swath in education; can teach a subject thoroughly; can treat a few principles and teach the whole truth about them first hand. But this is to attempt the impossible. Neither the immature nor the mature human mind works that way.

Dr. Simon Newcomb says:

The p'ausible system of learning one thing thoroughly before proceeding to another, and taking things up in their logical order only, should be abandoned. Let us train the pupil as rapidly as possible in the higher forms of thought and not be afraid of his having a little smattering of advanced subjects before they are reached in regular course. Let us remember that thoroughness of understanding is a slow growth, in which unconscious cerebration plays an important part, and leaves it to be slowly acquired. A teacher aiming at thoroughness might have kept Cayley or Sylvester working half his life on problems of advanced arithmetic without reaching his standard of thoroughness."⁴

³ W. H. Burr, *Science*, October 26, 1906.

⁴ Simon Newcomb, *Educational Review*, April, 1906.

The teachers of De Morgan, the mathematician, found him dull in mathematics.

Let me recall the scene from that charming little book, *Philip's Experiments*, where Philip and his father are surveying in the field when the schoolmaster is introduced.

Philip's schoolmaster pointed out that, after he had a systematic training in geometry and trigonometry, he would have little difficulty with the problems which arise in surveying. He also said that the plane table should have a telescope instead of rude sights, and he described various accurate instruments, and intimated that I was cultivating habits of inaccuracy in Philip. Training in science which was not highly accurate he believed was worse than no training at all. I listened, but I remembered that this teacher had kept Philip at work making highly accurate measurements with a delicate balance. The boy had not appreciated the construction of the balance, for he had never made weighings with a rough instrument, and his mind had been kept so fixed upon the third place of decimals that he did not appreciate what specific gravity really means. I could see that the schoolmaster in his endeavor to refine had forgotten the difficulties of an immature mind. Philip was on one contour line and he on another, and it would take more than a megaphone to put them into communication.⁵

In obtaining quantitative work, exactness must be demanded; but exactness is a quality that comes relatively late in youthful minds as in that of the race. We are attempting to force nature; we are anticipating maturity of mind when we crowd into a curriculum subjects in advance of the time when the mind of the average boy or girl is able satisfactorily to pursue these subjects. Probably the fault is not with the subject physics, but with the method. Too much quantitative work is demanded of both boys and girls; too little attention is given to the great names who have developed the subject and made inventions household words.⁶

We are too much afraid of teaching some things which have to be modified or even unlearned later. "Unlearning" is quite as educational as learning, and does no harm to a reasonable being; indeed, it may be a cure for bigotry. It is more important to cultivate open-mindedness than it is to be correct.

Professor Hopkins, in giving a simple, provisional definition of an acid, says:

At that stage of instruction this simple working definition is sufficient. More would be an enormity. What though the definition be untrue? The

⁵ John Trowbridge, *Philip's Experiments*, p. 79.

⁶ William L. Felter, *Educational Review*, April, 1906.

instruction, it is to be remembered, demands simplicity and progression—not truth. . . . It shows the subject presented, not as a carefully completed, rounded and exact definition . . . but as a part-truth at first which grows with his capacity for understanding.⁷

We are too sensitive about being up to date with our facts and theories. Since it has become impossible for any man to keep up with the literature of more than one subject, men have become timid about teaching more than one subject. But it is not difficult to show that the man who keeps himself moderately well informed upon the progress in several sciences is better prepared to teach than the one who knows only one subject. The weakest thing about research today is that our men are not *widely* informed.

One who has traveled much and become familiar with types of country may find his way through an unknown territory and readily suspect it when he is approaching a spot sought for. The ant studying his grains of sand does not get this view of a country. It is the "bird's-eye" view. Sailors by extended experience become accurate observers of weather phenomena. Miners and farmers and horse-dealers and experts of all kinds acquire their accuracy of knowledge chiefly by the extensive method.

Professor Trowbridge says: "The natural progress of our study of any subject is from the qualitative, or the comparatively rough evidence of our senses, to the quantitative."⁸ He says we need the countryman's habit of "hefting" a thing before weighing it.

Teachers in languages are everywhere insisting upon the advantages of reading at sight and reading widely. Why should teachers of science be slow to learn the science of teaching?

We talk about trying to rid ourselves of preconceived notions; but preconceived notions are quite necessary to progress, and the ability to preconceive notions is absolutely essential to research. It is no argument against a gift that it is capable of perversion. We want to be put in control of our faculties, not deprived of them by education.

⁷ Arthur John Hopkins, *School Science*, April, 1904.

⁸ John Trowbridge, *New Physics*, Preface.

We have reversed the natural order and tried to train high-school pupils in induction. Using the forms of induction in the high school may be a species of dishonesty. After all, the pupils learn not from the experiment, but from the teacher or the textbook. We teach them to test carbon dioxide gas with lime water, but we have to inform them that nothing else will turn lime water milky, and so it is only a roundabout way of telling them the whole story. We have great satisfaction in calling this the heuristic method, and we make the children prigs by leading them to think that they are acquiring knowledge first-hand.

The self-activity that high-school pupils need is that which they may get in the laboratory by doing experiments merely for the purpose of coming in contact with things, making their knowledge real, acquiring "a certain balance of judgment which comes from actual contact with things."

"The mind must rest upon physical laws for a comparatively long period in order to understand their true significance."

Pupils learn by imitation chiefly. Professor Trowbridge⁹ recommends performing in lectures the experiments which the students afterward perform themselves in the laboratory.

In many schools throughout this country one may find eminently successful teachers of physiography who proudly acknowledge that they learned *by imitation* of Professor William M. Davis both their subject and their method of teaching. I should characterize Professor Davis' method as an exceedingly skilful way of *giving the information* which his students could not acquire first-hand in a thousand years, and his method is equally successful in preparing students for research or for teaching.

The teaching of science should accomplish the greatest possible good to the greatest possible number. The time was when education proceeded without much reference to the public. It was intended for the select few. A rapid change is in progress. Within recent years the public high schools have become the most important educational institutions in the country. They surpass the colleges in buildings, laboratory equipment, and

⁹ *New Physics*, Preface.

teaching force—not only in quantity, but in quality. In the rapid growth of colleges, the available funds have not increased in proportion to the increase in number of students. The result is that the classes have been assigned inferior instructors.

The growth of research, by diverting funds and diverting men, has caused college teaching to deteriorate.

The general testimony of students is that they work much harder in the high school than in the college. Who knows how it might affect the intellectual and moral character of college students to have courses of instruction which were capable of absorbing their chief interest, so that they would not feel ashamed to say they were more interested in their studies than in their diversions?

Theoretically the pursuit of research ought to enrich one's teaching, but in actual practice attention to the art of teaching wanes as attention to research increases. The first requisite of a teacher is to be actuated by a desire—a fervent desire—to instruct others. If one can work at research and not have that ardor dampened, it is well. But to hold a teacher's position and to scorn the work of teaching is simply dishonest; and even though one's researches may be more valuable to the world than his instruction, those who have paid tuition for instruction have a just claim against him. Probably most of the money received from tuition fees and from endowment by undergraduate colleges was given for purposes of instruction; but, after diverting much of this to the support of research, and after giving the students very indifferent instruction, we tell them that their tuition fees do not cover the cost of their education.

These college students have a starvation course in measurements called physics. Their tutors, having just passed through the same course with excessive specialization, are suspicious of that expansive thing called culture. They affect to despise, not only the public, but all departments of learning other than their own. They surpass the theologians in narrowing down their lines of orthodoxy. Some teachers of science are like polarizers. The truth which gleams in all directions is narrowed down to one plane when it is transmitted by them. Their standards

would unclass Davy, Faraday, Tyndall, Pasteur, Humboldt, Maxwell, Huxley, Agassiz, Cooke, Shaler, and the like; for these men all preached the doctrine that science is good for culture and should be given to all. Those who interpret science as cold-blooded and exclusive have, not only nine-tenths of mankind against them, but a majority of the men of science, and particularly the leaders of all time.

Davy was a poet, and his high literary abilities made him a great teacher and likewise aided profoundly his researches. All of the men mentioned above were natural philosophers, with all the diversity of interests which that title indicates. All were humanists, and many of them devoutly religious.

The influence of the college in all departments, classical as well as scientific, is toward driving culture, in the sense in which I am using it, out of the schools; first, by narrowing the education which it gives to those who go out to teach in the schools, and, second, by prescribing a syllabus for the schools narrowly interpreted by examiners and bigotedly enforced by readers of examination papers. The schools cannot even give a cultural course in music. The brevity of life makes it necessary to have everything count toward entrance into college, and the college accepts only musical mathematics. There is not a department which is not handicapped in this way. It is impossible to teach anything as a culture when it is necessary to prepare for examination—particularly an examination set by another person. No one can justly estimate the progress and the proficiency of a class except one who has been with them throughout their study. If a supervisor's examination is thought to be necessary, let the teacher prepare the questions, and submit both questions and answers to the supervisor. For a "reader" in four minutes to pass upon a year's work of a student wholly unknown to him is an absurdity.

I cannot look upon a syllabus as a blessing, even though it may be prepared by a majority of the teachers. Why should uniformity be thought necessary or desirable? The "New Movement among Physics Teachers" is very helpful so long as it keeps in a state of solution, but we may regret its crystallization.

One may hope that, if we must have a syllabus, it may be extensive enough to include all that may be desired by any considerable number of teachers, and that each teacher shall be allowed great freedom of choice within the syllabus.

The high schools are coming nearer in touch with the public mind every day. They are powerfully influencing public sentiment, and are in turn being profoundly influenced by public sentiment. We have lately had evidence that science was in the ascendancy in the minds of the people, by their vast gifts for equipping schools and colleges for teaching science; but, unless our teaching is adapted to the needs of the majority, we shall soon see the funds drifting in other directions, or, what is more likely, we shall see ourselves drifted away from our moorings by the resistless tide.

In the ultimate analysis the same public supports the colleges and the schools. The college looks to the public for its funds, whether they be legacies or legislative grants or tuition receipts; it looks to the public for exemption from taxation; it looks to the public for the patronage of its sons and daughters. The public in turn demands of the college better service in the matter of giving instruction.

People have recently learned that they must square their lives according to physical principles, and they and their children have turned to educational institutions for information with an eagerness that is irresistible.

Their children have increased the attendance upon the colleges fivefold in recent years, and they themselves have entered university-extension courses in countless thousands. In some cases the extension courses furnish quite as good instruction as any given at the university. Faraday was started on his course as a scientist by Davy's public lectures; and Cooke says¹⁰ that he got his first taste of real knowledge from the lectures at the Lowell Institute, although he was a pupil in the Boston Latin School at the time—and that taste awakened an appetite which was never satisfied. Cooke says he eagerly sought the popular science of the day, which was vastly inferior to what we have

¹⁰ J. P. Cooke, *Scientific Culture and Other Essays*, p. 72.

today. We may now rank a few of the daily newspapers among our better teachers of science. Huxley said: "Science is not solely for the men of science, but for the people."

General courses in college should be culture courses. They should be what their name indicates—general surveys. A majority of the students in such courses will not and ought not to pursue the subject longer than one year, when we come to balance up the claims of all the subjects in a liberal course. Why then do the instructors persist in giving them that which is absolutely meaningless, unless it be joined to a protracted study of one subject for several years; and why do they give them that which properly belongs not so much at the beginning as at the end of the course in that particular subject? Such general-survey courses are quite as important to those who will go on to specialize in the subject as to the students who will pursue it no further. Large knowledge acquired by general surveys in many fields is necessary before one can select and organize. During his career in high school and undergraduate college a student should be encouraged to take general cultural courses in each and all the sciences, whether his aim is to specialize or not.

The time has already come when to know any one of the sciences thoroughly it is necessary to know the rest; in fact, all the so-called natural sciences are different branches of one great science.¹¹

It is not possible to get an elementary knowledge of any one science except by this process of browsing among many.

We have a duty to our children which we cannot avoid, if we would, and for which we shall be held responsible by our posterity. These children are entering life surrounded not only by all the wonders and glories of nature, but also by giant conditions, which, whether stationed on their path as a blessing or a curse, will inevitably strike if their behests are not obeyed. So far as science has been able to define these giant forms it is our duty, as it is our privilege, to point out to those we are bound to protect and guide; and in many cases it is in our power to change the curse into a blessing, and to transform the destructive demon into a guardian angel. After that command of language which the necessities of civilized life imperatively require, there is no acquisition which we can give our children that will exert so important an influence on their material welfare as a knowledge of the laws

¹¹ Elisha Gray, *Nature's Miracles*, p. 170.

of nature, under which they must live and to which they must conform; and throughout whose universal dominion the only question is whether men shall grovel as ignorant slaves or shall rule as intelligent servants.

It is perfectly possible for a child before fifteen years of age to acquire a real and living knowledge of the fundamental facts of nature on which physical science is based. This is not a question of natural endowment or special aptitude.

To arouse a love of study in any subject is to take the first step toward making your man a scholar (I want to emphasize scholar), while to fail to gain his interest in any study is to lose the whole end of education.¹²

We greatly wrong a pupil if we leave him unfitted to enter into the great inheritance of scientific truth obtained by past and present research. In striving to work out this problem let us, first, inculcate a habit of scientific thinking; second, give as wide a knowledge as possible, and third, awaken an interest which shall be lasting.¹³

Mr. Roy Fryer says:

That course is best which contributes most to general information and culture by acquainting the pupil with a wide range of chemical facts, while at the same time it trains his powers of observation and of reasoning from those observations.¹⁴

We make a great mistake when we shape our courses so as to eliminate all except those who are mathematically inclined and ready for specialization.

No educated man can expect to realize his best possibilities of usefulness without a practical knowledge of the methods of experimental science. . . . It is not to be expected or desired that many of our students should become professional men of science [yet] any system of education is radically defective which does not comprise a sufficient training in the methods of experimental science to make the mass of our educated men familiar with this tool of modern civilization.

The elementary principles and the more conspicuous facts of chemistry are so intimately associated with the experiences of everyday life, and find such important applications in the useful arts, that no man at the present day can be regarded as educated who is ignorant of them. . . . Physical science has become a great power in the world. Indeed, after religion, it is the greatest power of our modern civilization. Consider how much it has accomplished during the last century toward increasing the comforts and enlarging the intellectual vision of mankind. . . . It is frequently said,

¹² J. P. Cooke, *op. cit.*, p. 81.

¹³ J. H. Denbigh, *School Science*, October, 1906, p. 635.

¹⁴ Roy Fryer, *School Science*, December, 1906.

in defense of the exclusive study of the records of ancient learning, that they are the product of thinking, loving, and hating men like ourselves, and it is claimed that the study of science can never rise to the same nobility because it deals only with lifeless matter. But this is a mere play on words, a repetition of the error of the old schoolmen. Physical science is noble because it does deal with thought, and with the very noblest of all thought. . . . The ancient logic never relieved a moment of pain, or lifted an ounce of the burden of human misery. The modern logic has made a very large share of material comfort the common heritage of all civilized men.¹⁵

Teachers in their zeal for maintaining their standards often lose their missionary spirit, and act as though they would exclude the large majority of students from the department of knowledge over which they preside. Their love for a particular science has overshadowed their love for their fellow-men. Such are not true representatives of the men of science.

No teaching is of any real value that does not come directly from the intelligence and heart of the teacher, and thus appeal to the intelligence and heart of the pupil. . . . There is no nobler service than the life of a true teacher; but the mere taskmaster has no right to the teacher's name and can never attain the teacher's reward.

Value scientific studies not simply because they cultivate the perception and reasoning faculties, but also because they fill the mind with lofty ideals, elevated conceptions, and noble thoughts. Indeed, I claim that there is no better school in which to train the aesthetic faculties of the mind, the tastes, and the imagination than the study of natural science.¹⁶

The history of science tells of a "multitude who have worked in faith for the love of knowledge" and "made themselves and their fellows more noble men."

¹⁵ J. P. Cooke, *op cit.*

¹⁶ *Ibid.*

THE HIGH SCHOOLS OF NEW ENGLAND, AS JUDGED BY THE STANDARD OF THE COLLEGE CERTIFI- CATE BOARD

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Any attempt to secure articulation between the high schools and colleges is worthy of attention. Especially interesting is the attitude of the College Entrance Certificate Board, and the ability of the high schools of New England to satisfy the new demands. For this reason we have undertaken a careful investigation of existing conditions in order to determine how successfully the high schools are meeting the college requirements.

I. THE CERTIFICATE BOARD

The New England College Entrance Certificate Board was organized at Boston on May 16, 1902. The institutions now holding membership in the board are Amherst, Boston University, Bowdoin, Brown, Dartmouth, Mt. Holyoke, Smith, Tufts, University of Maine, Wellesley, Wesleyan, and Williams. The board originally consisted of nine institutions, but three more were admitted later until now it represents the large per cent. of colleges in New England which admit on certificate.

The high-school principals were soon given official notice that after January 1, 1904, no certificates would be accepted from any school in New England which had not been approved by the board. Thus all privileges were taken away from the just and the unjust alike, and things started upon a new basis. Among the rules of the board we find:

RULE V. No school shall be approved unless it has shown by the record of its students already admitted to college its ability to give thorough preparation for college; or unless it can satisfactorily meet such tests as the board may establish to determine its efficiency.

RULE VI. The board shall have the power of withdrawing approval from a school, and from such a school certificates shall not afterwards be accepted until it shall have again been approved by the board.

RULE VIII. A general report of the work of pupils from approved schools

for at least one-third of their first year in college shall be made to the board . . . and all complaints of insufficient preparations shall be made to the board with specifications as to subjects and individuals. . . .

While we pass over the query why the New England schools have been so grievously at fault that they should be thus discriminated against, we may congratulate ourselves that we have a standard by which we are able to judge the work of these schools. For, after making allowance for the idiosyncracy of the college professor, and his tendency to ride his special hobby, this standard is for the most part maintained without fear or favor, and constitutes the best available criterion of the preparation of the boys and girls for college work.

II. THE APPROVED LIST

How nearly the high schools of New England have been able to measure up to the required standard may be seen from the following table:

TABLE I

	Maine	N. H.	Vt.	Mass.	R. I.	Conn.
No. high schools in state.....	147	57	64	245	20	77
No. high schools with certificate privilege	25	17	9	112	11	15
Per cent. with certificate privilege.....	17	30	14	46	61	20

We are at once confronted by the question why so many of the high schools of New England are not on the approved list. The number below standard is appalling; so large, in fact, that one must admit that the high schools as a whole do not satisfy the requirements of the colleges. On the other hand many prominent educators hold that the colleges are too unreasonable in their demands and too unscientific in their methods; that the failures during the first term of the freshman year could be largely avoided by more pedagogical teaching and a logical attempt at correlation.

Up to November 1, 1905, 502 different schools applied for approval. Of these 220 were approved for three years, 48 were put on the trial list, and 136 were refused approval, 6 had to wait for the action of the board, and 92 had not as yet sent the secretary the required data. The 136 schools not approved were located as follows:

TABLE II

Maine	N. H.	Vt.	Mass.	R. I.	Conn.	Total
29	15	10	58	4	20	136

"Of these 87 are public schools, 27 are academies, and 22 are private schools. One-half, or 68, were rejected because the records of the pupils sent on certificate during the previous three years to the colleges represented on the board were not satisfactory. Most of the others failed of approval because the number of pupils received within the previous three years had been too small to enable the board to form a satisfactory opinion in regard to their work."

III. CLASSIFICATION OF HIGH SCHOOLS

High-school education in New England is individual and sporadic; there is no system. The character of instruction, the standard of attainment, and the general policy of the school, are determined by local sentiment. This, as every educator knows, is an uncertain quantity, often fluctuating, seldom reliable, and quite as often doing more harm than good. And while each of the states has a law providing that every boy or girl may, if prepared, attend an approved high school, and while the tuition, and in some states the transportation also, is paid by the town or state, this does not assure college preparation. For the school approved must be approved not by the colleges, but by the state superintendent of schools, and need not be on the certified list; hence the state does not in all cases provide free preparation for college.

The non-certified high schools may be divided into the following groups:

1. Schools which make no pretense of preparing for college, whose attendance is very small, often 10 or 15, whose teaching force is limited to one or two teachers, and which have no laboratory or library facilities. Further, many of these schools have only a two- or three-year course of study. Nearly one-half of the high schools, in some states, belong to the class under consideration.

2. High schools with larger numbers, even reaching 150 pupils, with fair equipment, but with a standard of scholarship so low that they never received certificate-rights with any of the allied colleges. These schools need toning up. Under proper management, and

especially if supported by the sentiment of the community, they could give a thorough preparation for college.

TABLE III

	Maine	N. H.	Vt.	Mass.	R. I.	Conn.
No. high schools.....	147	57	64	245	20	77
No. with fewer than 50 pupils.....	83	28	38	79	6	36
No. which should have certificate privilege.....	64	29	26	166	14	41
No. with certificate privilege.....	25	17	9	112	11	15

3. High schools with limited facilities but excellent ideals. These schools sent (we use the past tense purposely) occasionally to college. The demand for such preparation was not large, but when it came, the pupil was sent to college thoroughly grounded in the traditional classical course. The teaching force was small, the laboratory equipment offered inadequate, if any, advantages, the library consisted, like Lincoln's, of a few well-chosen volumes. Yet along certain lines these schools did an admirable work. For the most part they had certificate privileges with one college, and sought to meet the requirements of that college alone. Under the new régime they were practically cut off, owing either to a lack of equipment or unable to furnish sufficient evidence of ability to give thorough preparation. This latter consists in sending three satisfactorily prepared pupils to one or more of the allied colleges within three years. In fact some of these schools did not ask for the application blank. To be more accurate, we quote from the second annual report of the secretary of the board:

"When the board was organized there were five hundred and thirty-four (534) New England schools on the approved lists of one or more of the ten colleges which had been receiving students by certificate. Of these schools one hundred and forty (140) have not as yet been heard from; but of this number one hundred were on only one list, twenty-seven more had been approved by only two colleges, and only six (6) had had the approval of more than three."¹

4. Schools with limited facilities and poor scholarship. These sent only a few graduates to college. Their record was unsatisfactory, their influence demoralizing, and they exasperated the college authorities.

¹ These statistics apply to both high schools, academies, and private schools. The high schools constitute about two-thirds of the above number.

5. Schools with ample equipment, but whose pupils made a poor record for scholarship in college. For many of them no sufficient excuse can be offered. Even their officials acknowledge that the certificate privilege was abused, and that the school is justly paying the penalty for indiscretion. They have well-appointed buildings, adequate teaching force, excellent curricula; but the quality of work is poor. Moreover, when a graduate asks for a certificate to college the principal has not the courage to say "No," fearing either unpopularity or loss of position.

There is a disposition on the part of nearly all of these schools to reform, to get back onto the approved list again; but to some the conditions imposed are a source of annoyance. I quote from a representative letter written by a superintendent of schools:

"We are fitting boys for Harvard and Yale, and send a girl to Vassar next fall, and have several others preparing, but the N. E. C. E. Board refused us their O. K. Said we had sent no well-prepared pupils. Formerly, that is six years ago, we had a three-year high school but changed to four: Latin, Greek, French, three years, German, three years, good laboratories, and mathematics through trigonometry. We have five teachers on high-school work and ninety-five pupils. We send from six to ten to college each year, to Cornell, Vassar, Williams, and Univ. of Vermont."

6. Schools of good standing which object to issuing certificates in any form. The number of these institutions is very small, for the principle of certification is very generally recognized throughout New England.

IV. LOCAL AUTONOMY

In order to find out how far a lack of professional superintendence is responsible for the poor showing of the above schools, I included the following among a series of questions addressed to the principals of high schools: Is your high school under the charge, directly or indirectly, of a professional superintendent? The one hundred and twenty-five replies may be tabulated as has been done in Table IV. In a very few towns the high-school principal held the dual office of principal and superintendent. Moreover, of the twenty-eight schools never approved, but under a professional superintendent, at least twenty should be on the accredited list,

judging at least from the size of the school and the teaching force.

TABLE IV

Formerly Approved	Superintendent	Number
Yes	Yes	51
Yes	No	12
No	No	26
No	Yes	28
Uncertain of former relations		8
Total		125

At once the question arises, Is the quality of superintendence as efficient as it can be made? There is no gainsaying the fact that a careful examination of the above table might lead one to suppose that professional superintendence did, in many instances, more harm than good. But to one familiar with conditions in New England, it is evident that such is not the case. With few exceptions the superintendents are a hard-working, able, energetic, and conscientious body of men, doing the best that can be done under the restrictions placed upon them and the powers granted to them. As an illustration of the latter, Massachusetts, a few years ago, created the office of district superintendent by allowing two or more towns to unite in employing a superintendent. The only prerogative given by law to this official was the sole right of signing mill cards. For all his authority, for his professional status in the schools, he was indebted to the caprice or good sense of his committee. Thus it is only fair to state in behalf of the superintendents that their work in the schools is restricted and hampered by local sentiment—that all-powerful agency, especially in New England. Further there is no outside authority to act as a court of appeal, to insist upon a definite standard, to conserve the highest welfare of the schools in times of local squabbles. True there are state superintendents of schools, but they have no direct authority in the solution of local problems. Too often the superintendent is obliged to cater to public opinion, to worry over the impending meeting of his school board, to parry the thrusts of malicious opponents. Happy—and rare—is the man who can give his undivided attention to the work of his school, doing what is right with the sure knowledge that his committee will support him and that he will be secure in his official position. Here and there, indeed,

we find a disposition on the part of the school board to turn the management of the schools over to the superintendent, giving him free rein, and looking to him for results.

I have dealt thus fully with this topic because I am convinced that it is at the root of the evils of our school system. The notion of local autonomy, of town management of affairs, and the repugnance to outside interference, have become so deeply imbedded in the mind of the New Englander, that he is opposed to state control. Consequently New England has some of the very poorest, as well as the very best, schools in the United States. What is required to remedy this is a strongly centralized system of high schools, along the following lines:

1. A high-school inspector, who shall visit the schools, advise principals, teachers, and school boards, and secure a fairly uniform curriculum.
2. Special state aid to the smaller schools; these schools to be sufficiently equipped to prepare for college and technical school.
3. Uniform state examinations for entrance to and promotion in these schools.
4. Professionally trained teachers.

V. SQUARE DEALING

The answers to the question: In employing teachers can you rely upon testimonials from college professors? were interesting and shed light upon the present situation. For it has generally been supposed that the high-school principals only were at fault; college officials have repeatedly, and truthfully said the certificate privilege was at times abused; but experience and inquiry lead to the conclusion that the college authorities have been equally lax in giving testimonials to their students. This is evident from the tenor of the replies received. Thirteen answered the above question in the affirmative, fifteen in the negative, twenty-nine had had no experience, and sixty-eight qualified their answers as follows: "In some cases;" "To some extent;" "Not always;" "On questions of scholarship, yes;" "It depends upon who the professors are;" "We do not place much reliance upon them unless we know the professor."

It is refreshing to learn that there has been an awakening of

conscience in some of the New England colleges, for at least one of them has, I understand, established the unwritten law that testimonials are to be given only to the very best students. If this law should become operative in the other colleges, and if reliable educational bureaus could be established in all the higher institutions of learning, secondary education, and in turn all education, would be benefited thereby.

For, grammar school, high school, and college are inseparably related and mutually react upon one another. The high school is the great source of supply for the colleges, while the colleges furnish the teaching force for the high school. Thus the two are indissolubly bound together. If a high-school principal abuses the certificate privilege, the college suffers, and his own school indirectly; if on the other hand the college professors are too free in giving testimonials to their graduates, they seriously injure the high schools by foisting upon them incapable teachers, and later themselves, when ill-prepared students come from these schools. Granting certificates and writing testimonials should be held as a trust, and carefully guarded as such.

Let me give two extreme instances of flagrant abuse of confidence. A principal certifies to an entire department, no subject of which the boy has studied. This is nothing less than perjury. Again, a college faculty, from president down, gives flattering testimonials to a graduate who is hard of hearing, has an impediment of speech, is near-sighted, and manifestly deficient in educational attainment. Between these extremes there are many gradations, but the penalty for laxness is not the same.

In fact, the whole situation presents a sad picture of the lack of courage on the part of educated men. Too often the college professor is afraid to stand the consequences of telling the whole truth or of refusing to write a testimonial. Frequently a high-school principal will not face the consequences of denying a certificate to the scion of an influential family. The individual college hesitates to cut off from its approved list those schools which do not give adequate preparation; hence the alliance of colleges, for the colleges acting collectively can do what each one would shrink from doing individually. What is demanded is greater courage on the part of school and college officials: the backbone to stand up manfully and do what

is right, even if it does make enemies among the students, lose votes on the school board, or cause pupils to go to other colleges.

In justice to the Certificate Board I must say that in some instances at least it has respected the reputation for honesty on the part of the principals, and granted the certificate privilege when the previous record of the school did not warrant it, but owing to a change of principal, conditions were changed. I believe that the board is composed of fair-minded men and women, whose honesty of purpose cannot be questioned. Further, the board has advanced the cause of education in that the standard of a large number of schools has been raised, and principals are more careful in issuing certificates.

VI. THE SMALL HIGH SCHOOL

In comparing the small and the large high school the presumption is usually in favor of the larger institutions. The Certificate Board, however, is in no way influenced by the size of a school; it forms its opinion from the equipment and from the record in college of the graduates of that school. Thus we have an impartial judgment of the merits of the two classes of schools. We naturally expect the larger with its higher-salaried teachers, its better equipment, and more elaborate course of study, to turn out much stronger graduates and overshadow the smaller.

TABLE V

	Maine	N. H.	Vt.	Mass.	R. I.	Conn.
No. high schools with certificate privilege	25	17	9	112	11	15
No. of above with fewer than 100 pupils	12	8	3	24	3	8
Per cent. of above with fewer than 100 pupils	48	47	33	21	27	53
No. towns with 8,000 or more population	11	9	3	81	12	20

VII. UNIFORMITY OF TEST

A prolific source of failure during the freshman year is the lack of any uniformity in testing a student's preparation. So far as the definition of requirements for admission to college is concerned there is, practically, uniformity. And yet, as every secondary teacher knows, this uniformity is only apparent; for there is no uniformity of testing the pupil's preparation. As a matter of fact the individuality of the college is a potent factor in fitting for that college. To illustrate: In history one college emphasizes method; another, original

research; a third wants the pupil's mind crammed with the facts of history; while still a fourth lays stress upon present events. So also in Latin; one college will go into the minutiae of syntax and etymology; another gives special attention to rapid translation; while a third teaches Latin as literature. Hence I maintain that it would be much fairer to the secondary school, as well as better for the student himself, if the instructor during the first term in college could be less one-sided, and if the colleges could agree upon a uniform test of preparedness.

VIII. THE ACCREDITED SCHOOLS

The following table, taken from the report of the secretary of the Certificate Board for the year 1904-5, furnishes data for comparison between the results of certifying and examining, and also shows in what way the approved schools are meeting the requirements of the colleges:

TABLE VI

	English	Latin	Greek	French	German	Mathematics
No. examined.....	239	184	71	155	70	273
No. failed 1st term.....	13	5	3	10	7	31
Per cent. failed 1st term.....	5.5	2.7	4.2	6.5	10	13.1
No. certified.....	829	711	309	590	370	819
No. failed 1st term.....	79	31	6	52	29	105
Per cent. failed 1st term.....	9.5	4.4	1.9	8.8	7.8	12.8
Per cent. unsatisfactory in 1903-4*.....	20.2	14	11.8	14	13.4	26.4

* Before the inauguration of the present system.

The above statistics afford ample testimony to the thorough manner in which the accredited schools are doing their work, and to the good judgment of the principals who grant certificates. The per cent. of failures is very low, when all conditions are considered. This is especially true in Greek and Latin, while in the other subjects the per cent. is very gratifying. Probably many of the failures in mathematics are due to the recent changes in algebra and geometry. Even here the number is small, relatively. If out of a class of forty entering the high school only five should fail to carry their work successfully, we high-school men would be greatly delighted. Yet why should the college faculties expect a condition to obtain with them that is found nowhere else? If out of a class of fifty in Greek

only one student fails to carry his work successfully, we are bound to admit that the high schools are giving as thorough a preparation in that subject as any reasonable person could possibly expect.

In conclusion I must express my regret that the present method is not a solution of the vexed problem of articulation between high school and college. We must seek farther for some way by which the colleges may have a direct and constructive influence upon the secondary schools. The suggestions of this plan may be obtained from the systems operative outside of New England.

IS THE PRESENT MODE OF GRANTING CERTIFICATE-RIGHTS TO PREPARATORY SCHOOLS SATISFACTORY?¹

NATHANIEL F. DAVIS
Brown University

For the opportunity of addressing you this morning I am doubtless indebted to my position as secretary of the New England College Entrance Certificate Board, which, as the representative of twelve colleges, grants the certificate privilege to certain preparatory schools in New England. Although more than one mode of giving certificate-rights is now in use in this country, since the singular form of the word "mode" is used in the subject, I presume the action of the board which I represent will be the principal subject for the discussion. I find myself, therefore, somewhat in the condition of the Irishman who, when asked by the court whether he was guilty or not guilty, replied that he could not tell until he had heard the evidence. So far as I can see, the only thing for me to do in opening this discussion is to describe the plan followed by the board. If I do not succeed in making the method clear, I shall be pleased to answer any questions that may be asked.

The present mode of granting the certificate privilege is largely the result of evolution and not of foreordination. The board has not anticipated difficulties, but rather has met them as they have arisen. In order to give a clear view of the present condition, it will be well to speak briefly of the origin of the board and of what it was organized to accomplish. The idea of the board originated with the Commission of Colleges in New England on Entrance Examinations, which did much to forward uniform requirements for admission to the New England colleges, but which is now either dead or in a comatose condition. The members of the college faculties were divided in opinion about the relative merits of examinations and certificates, but all were united in believing that the certificate system must be developed or abandoned. In response to an invitation from this Commission on Entrance Examinations, delegates from nine New England colleges met in Boston, formulated a plan of mutual co-operation, and submitted the same to the colleges with the understanding that the assent of seven should be necessary for the formation of the board. Eight responded, and

¹ Read before the New England Association of Colleges and Preparatory Schools, Cambridge, Mass., September 26, 1906.

the board was accordingly formed. Since then four more colleges have assented to the agreement and have been recognized by the board.

During the preliminary discussions certain things became very clear. The certificate system was not thought of as an easy method by which young people could enter college, or as a means of shirking labor and responsibility in the matter of examinations on the part of college officers. Neither did there appear any desire, on the part of the colleges, to assume a right to dictate to the schools as to methods or curricula, but rather a desire to foster the individuality of the school and of its teachers, to increase the independence of all connected with secondary education, and to counteract as far as possible the tendency to spend too much valuable time "in preparing for examinations." The object seemed to be to select in the most efficient way those students who were prepared to carry on the college work successfully. In fact, from the beginning, the board has honestly tried to bring about the ideal condition so recently discovered and described by Professor Thorndike in the *Educational Review* for May, 1906.

In granting the certificate privilege to certain schools for a longer or shorter time, the board neither claims nor imagines that it has enrolled on its list all of the good schools even in New England, or has omitted all of the poor ones. It simply declares, in publishing a list of approved schools, that it has good reason, founded on actual experience, for believing that the certificates of certain schools can be depended upon, and that it has good reason for hoping that the certificates of the remaining schools will prove to be of the same high standard. In the last clause the schools on the trial list are of course referred to.

I trust all present will agree with me that these ends are desirable, although the means about to be described may be imperfect and may work hardships in some cases. Let us now turn to the methods which the board has devised for the accomplishment of these ends.

When the board commenced its work, it had no list of approved schools inherited from a previous organization, neither did it have any data upon which to proceed. Its first act, therefore, after providing for its organization, was to request each college to notify each school on its approved list that the certificate privilege would expire at a certain date, which provided for two full school years within which to adjust itself to the new conditions, in order that no injustice might be done to any school which already had certificate privileges at the individual colleges. This act is characteristic of the desire of the board that, while it should endeavor to establish and maintain a high standard for the certificate privilege, it would also proceed with such deliberation as not to interfere with the regular working of the school.

The next act of the board was to provide for obtaining all the data possible to aid it in its decisions; and three kinds seemed to be available. In the first place, each college was requested to send to the secretary a complete list of the schools to which it, at the time of the inquiry, conceded the certificate privilege, and to classify these schools into four groups, the first to contain those which were regarded as satisfactory, the second those from which too few pupils had been received to warrant the expression of an opinion, the third those which were regarded as doubtful, and the fourth those which were considered unsatisfactory. Schools from which no pupil had been received within three years were placed in the second class.

Each college was also requested to send to the secretary the number of persons admitted on certificate from each school in each subject and the number of those in each case who had proved unsatisfactory. These data were the less satisfactory because of a lack of uniformity in the reports. Some of the colleges reported the number who had failed to pass; others reported those who, having passed, had failed to obtain a satisfactory standing; while a third class, considering that the failures in many cases were not due to the preparation, did not report even all those who had failed. When one college would report 40 per cent. in some subjects unsatisfactory, and another college only 5 per cent. or 6 per cent. in the same subject, it became necessary for the board to recognize a personal equation. At present the report is based on the number who fail to pass during the first term or semester, and the reports have become more uniform. Records of this kind were obtained for the three years 1900, 1901, and 1902, and before the first decisions were made the reports for 1903 were available.

And finally, when the schools were notified by the colleges that their certificate privileges would terminate at a certain time, they were directed to apply to the secretary of the board, should they desire the certificate privilege for the future. To each principal who applied was sent a pamphlet containing two pages of general questions relating to the size of the school, the number of teachers, whether college graduates or otherwise, the time allotted to each course, etc., two pages of questions for each of the more important subjects accepted for admission and one for the less important. It was intended to include every subject that could be presented for admission at any college represented on the board. Such a set of questions is very difficult to frame. The end in view was to secure satisfactory information concerning the different curricula, both as to their extent and as to the nature of the instruction given, and not directly or indirectly to dictate in respect to either. The board does not expect any one school necessarily to give instruction in each of the subjects mentioned. It does, however, require that a sufficient number of courses shall be offered to prepare for

some course leading to a degree in some one of the colleges represented on the board, and that, if a subject is to be included among those in which certificates are to be granted, an adequate number of periods shall be assigned to it, and a sufficient amount of apparatus for its proper presentation must be in the possession of the school. For example, it is not necessary for a school to include in its curriculum any of the sciences; but if chemistry or botany is to be included, more than a single term of from twelve to fifteen weeks, with three or four periods per week, must be assigned to it, and certainly for the former subject there must be sufficient apparatus to enable each pupil to perform individual experiments. Just at this point permit me to say that the board has reason for specially criticizing the time allotted to the courses in history, botany, astronomy, and physiography. After reading from four to five hundred of these applications, the secretary of the board takes pleasure in congratulating the principals of the schools on the whole for the careful and complete way in which these reports have been made out.

These three different kinds of data were what guided the board in making its first list of approved schools. I desire to emphasize especially that the board was forming an entirely new list of approved schools, and not trying to revise an old one, and that the new list was based upon the actual experience of its constituent members, and not upon the general reputation of the schools in question, or upon their relations to other institutions. Of course, some mistakes were made, but the board has always been ready upon request to reconsider a decision at its next meeting, and even between the meetings whenever it has appeared that the data upon which it acted were so incorrect as to have affected the former action.

While forming this first list, the board found a considerable number of schools which had had the certificate privilege at one or more of the colleges represented on it, about which it did not have sufficient data to warrant a full approval, but against which there was little of a positive nature to be said. Realizing that it was a transitional period in the certificate system, the board decided to form for one year a trial list for such schools, hoping to obtain during that year more data. This scheme worked very satisfactorily in many cases, enabling the board without hesitation both to approve some schools and to reject others. A doubtful list still remained, and those schools which could assure the board that they had pupils to send to college during the next academic year were continued on this trial list, and the remaining schools were notified that the full certificate privilege could not be granted them.

The trial list, as outlined above, was at first regarded as a temporary device for meeting an emergency that arose in connection with the forma-

tion of the first list. It has, however, been developed into a permanent part of the system, in order to meet the difficulties that arise in dealing with schools from which certificates have not been received by any college represented on the board. The fundamental principle upon which the board's action is founded is that no school shall be approved until the accuracy of its judgment in granting certificates has been put to a practical test. The experience of the board has taught it that a school may prepare pupils who will successfully meet examination tests and yet give certificates which cannot be depended upon. The board therefore at its last meeting decided that no school should be placed on the approval list for the full period of three years until it had been on the trial list for one year. As the trial list carries with it, to some extent, the approval of the board, it was found necessary to restrict its membership to such schools as would probably be finally approved. After such discussion the board has, therefore, adopted the rule that "any school in New England which has never been rejected by the board, and has sent two or more satisfactory students to any college or colleges represented on the board, and which has a candidate for admission for the ensuing year, may be placed on the trial list;" a rule which contains two material restrictions. As the board does not consider records more than four years old, and in some cases not more than three years old, it is implied in this rule that the entrance examinations of the students in question must have been taken within three years of the date of the application, and that the students must have been admitted to college and must have obtained a record. The mere ability to pass the entrance examinations is not regarded as sufficient, as the real test is ability to carry successfully the college work. This leads me, speaking for myself and not for the board, to say that preparation for college should consist of two elements, the moral as well as the intellectual, and that, in my opinion, the former is as important as the latter in any secondary school. Far too many college men and women, who are able to pass the entrance examinations, fail at the very beginning of their college life, or, if they succeed in reaching the second year, make a failure of their college course, because of the lack of this training in the preparatory school. But to return: The board must soon plan some definite way of distinguishing between pupils taking the examinations with the approval of the principal of the school from which they come and those who come without such approval. It is obviously unfair to the school to hold it responsible for pupils it does not recommend, and this test is useless if the school is allowed to select its representatives after the results are known. By the formation of this trial test, so guarded, the board hopes to be able to adhere strictly to the fundamental principle already enunciated, that it will base full approval only on its own actual experience.

So far we have considered only the first applications of schools. Schools that have asked for approval, and have been refused by the board, may be divided into two classes: first, those which have been refused because they have not sent a sufficient number of pupils within the stated time to colleges represented on the board; and, second, those which have been refused because of the poor record their pupils have made at these colleges. The first class are not affected by the first application and stand in the same relation to the board as schools that have never asked for recognition, and as soon as they have completed a satisfactory record, an application will be received and passed upon by the board. The second class stand in an entirely different relation. In respect to these schools, the following rule has been adopted: "Schools which have been rejected because of the poor records of pupils sent to college on certificate, or which shall be dropped from the list of approved schools for cause, must send at least three pupils to the colleges connected with the board within a period of three years before a new application for approval will even be considered." Furthermore, in considering such an application the board would feel that a school, having been tried and found wanting, must have established a thoroughly good record before it can expect to be approved.

It now remains to consider the attitude of the board toward schools which have been fully approved. The board retains the right to drop a school at any time, if the record in its opinion calls for such action; but this measure will probably seldom be resorted to, except in extreme cases, until due warning has been given. The board has adopted two forms for warning such schools on its approved list, one simply calling attention to the record of the school which is stated in the warning, and the other adding the positive statement that, unless improvement follows, the certificate privilege may be withdrawn. These notices are sent when the record in some one subject is very poor, although the rest of the record is excellent, or when even a few failures have been reported in a number of subjects. In the first case it is the opinion of the board that that department of the school needs a thorough reorganization, while in the latter case there is probably carelessness in the granting of the certificate, possibly a too low minimum mark having been adopted. Although the period of approval is limited in all cases to three years, the schools at the expiration of this time do not stand in the same relation to the board as new schools. While the board will not grant a continuance of its approval without a direct request from the school, it does not require the filling-out again in detail of the application blank which a new school uses in describing its curriculum. It simply desires that the school shall make a formal request by means of a blank furnished by the board, and shall state any material changes in its

curriculum. Once approved, a school always retains the favor of the board if the certificates of the school do not fall below par at the colleges receiving them.

The task assigned me is practically ended, but I may facilitate the discussion somewhat by calling attention to some of the complaints which have reached me. They can be classified as follows:

1. Too long intervals between the meetings of the board.
2. A supposed prejudice on the part of the board against the small school.
3. The refusal of the board to recognize the records made at colleges not represented on the board.

4. The difficulty experienced by a new school in obtaining recognition.

The board meets annually in May, and it does not usually meet at any other time. During the first year there were two meetings, in order that the applications might be promptly dealt with. Schools on the approved list are allowed to apply for a continuation of the certificate privilege in advance, so that they may always know a full year before its expiration if the privilege is not to be continued. The schools on the trial list are placed on that list in order to obtain additional evidence, and often this cannot be obtained before the first of April. Consequently, an additional meeting of the board would in no way benefit these. The only schools, therefore, which an extra meeting of the board would benefit are those which are seeking approval, and these are now comparatively few in number. At this time only four of this kind are waiting for the decision of the board. The schools are required to have their applications in the hands of the secretary before April 1, in order that the meeting of the board may be held early in May, and the decisions known in season to enable pupils, who are not to obtain a certificate, to take the examinations.

As to the second complaint, I can positively assert that there is no prejudice on the part of the board against the small school. A school having two or three teachers, and sending on the average only one pupil to college each year, is readily approved if the pupils sent are satisfactory. This objection is imaginary, not real.

There seems, however, to be a real difficulty on the part of many principals in understanding the reasons why the board does not recognize records made at colleges not represented on the board. If there were no other reasons, the fact that it would be necessary for the board to classify the colleges, and designate those whose records would be accepted, would be sufficient to prevent the adoption of such a plan. In addition to this, the board cannot consent to put a college not connected with it to the trouble of sending complete records of all the representatives of a school for three or four years, and an incomplete record would be misleading. Still further,

the records of a college admitting only by examination would be useless to the board, as they would furnish no indication of the value of a certificate from the school. The pupils representing the school would have been chosen by the college and not by the school, and would furnish better evidence for the approval of the college than for the approval of the school. More than this, if I may be permitted to speak quite plainly, principals have written to me requesting that their schools be judged by the records of pupils sent on examination to some other college, rather than by those sent on certificate to the colleges connected with the board, because they sometimes gave certificates to pupils who, they thought, might fail on the examinations. Even though the statements of all colleges were the same, it would thus be impracticable to accept records from colleges not represented on the board. If the board were claiming to establish a list of the best schools in New England, it might be necessary to consider such evidence. But, as I said at the very beginning, this is not the object of the board.

The claim that it is difficult to establish a private school in New England, especially if it be a school for young ladies, is well founded. It cannot be avoided without sacrificing the very fundamental principles upon which the action of the board is based. When such a school has established the credit of its certificate, it will be heartily welcomed. A place on the list is a valuable asset for such a school, and the cost should be met cheerfully.

In closing, allow me to say that the board does not for one moment feel that it is infallible, or that the last word has been said as to its methods of procedure. The board is not hostile to the secondary school, but desires to be in full sympathy with it, and will gladly co-operate in any attempt to improve secondary-school work. The problem of the college and of the preparatory school is the same. The one can prosper only as the other prospers. The board desires only to guard the certificate system in order that by preserving that system we may safeguard the independence of the preparatory school and save it from the doom of becoming a mere cramming machine to which the examination system left to itself would inevitably condemn it.

THE NESTOR OF AMERICAN SCHOOLMASTERS

CHEESMAN A. HERRICK

To have rounded out eighty and two years in perfect health and with well-preserved faculties; to have completed sixty-three years in the arduous calling of a teacher, the last twenty-eight of which have been without a day's absence because of illness; to have taught high ideals and shown a worthy example to above twenty thousand young men, and sent them forth to the usefulness and honor in public and private life; to have been schoolmaster to the United States senators, governors, and judges; to see his children and grandchildren pass through his own school, and in the heyday of youth to welcome his great-grandchildren as associates in the pursuit of knowledge; to stand as a stalwart oak while friends, colleagues, and family pass to the beyond; to keep amid all perplexities and vicissitudes a simple trust and an unswerving devotion to duty—this is but the life-history of Professor Zephaniah Hopper, of the Philadelphia Central High School. Today no citizen of Philadelphia is more respected than is this unpretentious teacher of young men, who seems to have found in disinterested service the secret of perpetual youth.

Zephaniah Hopper is of Quaker stock. His father was a carpenter with limited means, and, as young Zephaniah was the oldest of seven children, he was kept at school with difficulty, and kept there at all only because certain of his teachers urged that the lad's earnestness be rewarded with an opportunity to continue his studies. Of his school days Professor Hopper says he is sure that any good showing he may have made was more the result of diligent application than of superior talent, as he has always acquired knowledge with difficulty.

In 1838 the Central High School was established, and a year later young Hopper entered as a member of its second class. Marked ability on his part gained for him promotion to the first

class, and he was graduated in 1842. At the Central High School he came under the presidency of Alexander Dallas Bache, a great-grandson of Benjamin Franklin, who had already made for himself an honored name by his report on *Education in Europe*. The Central High School in which Zephaniah Hopper was educated was the embodiment of the educational ideal of one of the most advanced thinkers of his time, and the Central High School still bears the mark of Bache's influence.

Professor Hopper's life as student and teacher covers the period of free schools in Pennsylvania. While he was still at a private school in 1834, Thaddeus Stevens made his impassioned defense of the free school bill and secured state-supported schools. The Central High School was an early result of free education in Pennsylvania; it is also one of the oldest public high schools of the country. Few schools have done more for their communities than has the Central High School for Philadelphia; in manufactures and commerce, in the professions and public service, its graduates have had honored places, and throughout they have stood for what is best in the life of the city. Of this great school Zephaniah Hopper was first the product, and in it he has later been a most positive and beneficial influence.

In the autumn of 1842 Professor Hopper began his career as a teacher, at the salary of \$200 a year. At this time he walked a distance of seven miles to school in the morning and back again at night. Five years later the young schoolmaster became principal of the Jefferson Grammar School in Philadelphia, and here he soon made a reputation by his character and earnestness. These were the days of learning by effort, and Professor Hopper tells how he came to realize that in accurate work and strict drill there is a moral quality as well as a mental discipline. Few men are more famed than he as drillmaster and disciplinarian. Corporal punishment was common—"birching" the subject of our sketch calls it; and he is still remembered by Jefferson School boys as possessor of a vigorous arm who used to knock the dust out of the jackets of offenders; but the reminiscences of those days never fail to mention what are likely the most striking

characteristics of this man—his sense of justice and his fine discrimination in dealing with boys. The craft of the schoolmaster has changed much since the forties, but this great teacher has kept pace with the changes, and he is firm in the opinion that the days that are now are better than were those of old time.

The Jefferson Grammar School developed such an *esprit de corps* that its students of an earlier generation still point with pride to their connection with the school. The record of those from this school in passing for admission into the Central High School, and the character of their work after being admitted, reflected such credit on their principal that in 1854 he was asked to become a teacher in the school that had educated him. From the date of his appointment his service has been continuous; and the wonder is, as was remarked by the late United States commissioner of education, that human strength could have endured for so many years.

Professor Hopper began as a teacher of English, but his success as a private tutor in mathematics led to his transfer to that department. In 1869 he became a teacher in the Artisans' Night School in the Central High School building and later he was for twenty years principal of this school. Twice, for a space aggregating above two years, Professor Hopper was acting-president of the Central High School; but he refused to accept the presidency permanently, merely discharging the duties of the office until a suitable person could be found to relieve him, when he returned to the more intimate association he would have with pupils in the classroom. These decisions now appear as an evidence of the man's inspired common-sense, for they have contributed to length of life and increased usefulness.

In 1892 Professor Hopper lost his life's companion, to whom he had been married in 1845. His married life had been almost ideal, and, as he is a man of deep feeling and close home ties, the loss of his wife proved almost more than he could bear. He found comfort in his children, grandchildren, and great-grandchildren, and through them he has kept up the home interest; but he has also found consolation in communion with nature, and he has become in the past fourteen years an ardent and

skilled botanist. No youth ever pursued knowledge with keener zest than is shown by this young octogenarian. His regret is that he did not start in this field of science earlier in life, for he fears that he will not be able to compass the field to his satisfaction.

With the new interest the schoolmaster connected himself with the Philadelphia Academy of Natural Sciences and joined its botanical expeditions. Not content with these, he organizes parties of his own, or goes alone; and in this way he has explored the country for many miles discovering rare specimens of flowers. Each season brings its delights; in the winter he studies trees and works in the extensive herbarium of the academy; summer and autumn flowers are eagerly sought, the dates of their appearance noted, and these compared with the times of their former appearance. This interest is kept up at Atlantic City, where Professor Hopper spends his vacations. In the early mornings and forenoons of the summer he takes long walks and gathers the flowers, to which he devotes the afternoons. He takes much pride in mounting his specimens and has prepared a private herbarium. As duplicate specimens are secured, they are prepared, and either the originals or the duplicates are presented to his friends.

Those who know this schoolmaster's interest often send him rare specimens of flowers from a distance, and he is always ready to exchange for these the flowers of his own locality. His diary contains repeated mention of some rare walk, some new flower, or the special beauty of an old friend. The activity of the man in this field of his endeavor is striking. His diary records that in 1903 he made eighty-eight botanical journeys, secured and mounted over four hundred specimens, gave away nearly four hundred specimens, and had twenty correspondents on botanical subjects. And all this time our botanist has been a teacher of mathematics. But he has found in botany an opportunity for out-of-door life, a means of health, and a diversion from his regular duties. In short, Professor Hopper attributes his present preserved health to his interest in botany, and he recommends the rule: "Ride a hobby and keep young."

But what of the teaching of Zephaniah Hopper all these years? Long ago he took as his ideal: "Never be old," and, "Be a friend of the boys." Those who know the man can testify how well he has realized his ideal. He walks with a sprightly, strong step; his carriage is erect, and his attention alert. With a show of pride he says: "I walk from my house to the school [a distance of sixteen city squares, or nearly two miles] in exactly twenty-seven minutes;" adding, with a twinkle of the eye: "which I think is as well as I could have done sixty years ago." In considering Professor Hopper, one is reminded at many points of Dr. Thomas Arnold; he has Arnold's pride of physical strength, and the feeling that any show of weakness would lower him in the estimation of his pupils. Recently the writer took a visitor to his classroom. He was standing in the center of the room; there were a dozen boys at the board; everything was at attention, and the work was going on admirably. One feels that this quiet, positive man may be sixty, but one's own senses belie the statement that he is eighty-two.

The secret of Professor Hopper's success in teaching is preparedness and the faithful devotion to details. Regularly he arrives at school at five minutes before eight; he goes to his room, lays out his working materials, and prepares for every detail of the day's work. No general ever planned a campaign with greater minuteness than that with which this teacher plans the work of each day. As a result he is never caught off his guard; he has prepared for every emergency. A president of the Philadelphia Board of Education, who was in Professor Hopper's classes in 1854, says of him that he commanded the respect of every boy that came to his room; that his very presence preserved order; etc. If this great teacher could give to the teachers of America the practical lesson of the worth of preparedness, he would render a greater service than would be done by the writing of innumerable books on the theory of education.

It is as a friend of the boys that Professor Hopper is most attractive. Fairness, friendliness, and cheerfulness have been his watchwords. But his friendship is no weak sentimentalism that coddles boys and condones their shortcomings; there are in

his character a ruggedness and stern justice, which are shown in dealing with dereliction; and yet no boy ever passed from his influence without feeling that he had come under the shadow of one who hated meanness and loved nobility. A man could not well have lived for sixty-three years in intimate association with young lives and not love those for whom he has worked. Professor Hopper's colleagues know that his justice is always enforced with a thought of the good of the boys, and, if in aught he errs, it is in tempering justice with too great mercy. He has been respected to a remarkable degree by the boys of the Central High School, and he is one of the few whom the successive generations of students have not dubbed with a nickname. True, his length of service has been the occasion of some pleasant railery, but always attended with respect, and this pleasantry has been enjoyed by no one more than by Professor Hopper himself. A song has been composed, going to the tune of "Yankee Doodle," and containing such lines as:

When Zephaniah was quite small,
He played with Billy Penn, sir;

and

Zephaniah is our joy,
Our "Grand Old Man,"
Our youngest boy.

A sight never to be forgotten is the greeting to their old teacher by the Central High School alumni at their annual reunions. He is always called on for a speech, and he always gets the same generous, hearty welcome. His face beams with pride as he speaks to the large body of men whom he has helped to train; many of these men have come to high honors, and not a few of them seem Professor Hopper's seniors. As one contemplates this scene, he cannot avoid the conclusion: To be such a man, and sit thus enthroned in the heart's affection, is better than to wear a crown of empire.

In passing to his broader life, we find Professor Hopper a useful citizen, a Christian gentleman of temperate habits and refined tastes. He is probably without an enemy in the world. Of him in truth we could say: "He knows not how to speak a

word of harshness or how to make a foe." In these last days there come from every side tributes to his life and work. His name has become a household word in Philadelphia. John Wanamaker writes his congratulations, and adds: "I remember your name almost back to my first days in Philadelphia." In these hurrying times men have come and gone and are forgotten; but here in the serenity of youthful age is one who has gone on and on, and whose influence will go on forever. Not only is Professor Hopper a great teacher, but he is a remarkable example of the blessings of a life lived without worldly ambition or ostentation; he has the rewards of a man who seeks in a quiet way to do day by day the tasks which the successive days bring. When asked to express a sentiment with regard to his past life, he said, in words choked with emotion: "When I reflect that I have had continuous employment as a teacher since 1842, that I have had good health, and felt in love with my work, I cannot find words to express my gratitude."

Zephaniah Hopper is a refutation of the theory that a man should be superannuated at forty, at sixty, or at any other age.

EDITORIAL NOTES

In the confused struggle that is going on in the school system of Chicago there are three more or less conflicting forces: the superintendent of schools, Mr. E. G. Cooley, known by reputation to all readers of the *Review*; a Board of Education, recently reconstituted by Mayor Dunne, which has shown itself critical of, and at times hostile to, the policies which the superintendent claims to be necessary to his efficient direction of the schools of the city; and finally the Teachers' Federation, which has fought what it has considered the cause of the teachers in the courts, in the city council, and at the capital of the state.

Superintendent Cooley won recognition, when he came into the system, by suppressing political pull in the appointment of teachers and by efficient organization of the school system. These achievements of his are not now subject to criticism. He has, however, identified himself with a procedure in the promotion of teachers which has remained the bone of contention from the time when it was inaugurated up to the present time. It is to be noted that it has provided ever-increasing fuel for the conflict between the superintendent and a large part of the teaching force, which has grown steadily more profound and more bitter since its inauguration.

The Teachers' Federation is chiefly known for two things. When the Board of Education some years ago cut down the salaries of the teachers because of lack of funds in their treasury, this federation through its officers investigated the sources of revenue of the city, discovered numerous instances of tax-dodging, took these into court, and brought into the treasury of the city \$600,000 which but for their efforts would have been yearly lost to the city government. Of this, \$250,000 goes annually into the treasury of the Board of Education. When the school board compromised the suit brought by the Teachers' Federation and paid these teachers the amount that had been withheld from their salaries, the Federation unquestionably lost a great opportunity in not dividing this money among all the teachers who had suffered, and in whose interests they professed to be fighting. The Federation undertook also to further and protect the interests, or what it conceived to be the interests of the teachers in combating legislation at Springfield and in influencing the administration in the city of Chicago. It sought for political backing, and found it only among the labor unions. Organized labor in the city gave them this backing, but asked them almost as a *quid pro quo* to become affiliated with the Federation of Labor. It is only fair to note that the teachers in this federation have not been unionized, that they are under no obligations to identify themselves with the labor fights in the city, and

that they have not done so. They have gained very considerable influence through their affiliation with federated labor. It would be difficult to point to any return they have made beyond the mere fact of their affiliation.

It should be noted, further, that the moment at which the new method of promotion was introduced was that at which it was necessary to cut down the salaries of the teachers. This method called for an examination at the end of seven years of service, as the test of the teachers' eligibility for further advance in salary. The examination was to be upon work done outside the schoolroom upon academic subjects in the main.¹ The impression was quite generally formed that the examination formed a barrier to the advancement of a large number of teachers, and thus relieved the treasury proportionately, while it removed from the city the stigma of cutting down the teachers' salaries because of lack of funds.

It is, of course, unjust to imply that this was the end which Superintendent Cooley had in mind. He is a firm believer in the efficacy of such outside academic work in increasing the effectiveness of the teaching force. It is, however, easy to see that the introduction of the measure at such a time and with such a result has embittered the teachers who had themselves by their unaided efforts been enriching the city's treasury. It seemed like a sinister return for their laudable and public-spirited achievement.

It is questionable whether the city of Chicago has ever had as much intellectual ability, as much restless energy and public-spirited devotion represented on its somewhat unwieldy school board as at present. Among those appointed by Mayor Dunne the majority perhaps have been in sympathy with the struggle which the Teachers' Federation has been making, and have been ready to support the criticisms made upon Superintendent Cooley's policy of promotion by the teachers of the Federation.

That the board has been perfectly honest in its exhausting efforts to reach a conclusion in this fight there is not a moment's ground for questioning. Its members have been called radical and socialistic. They have been abominably abused by the city press, but no evidence has been presented to indicate any improper motive behind their discussions nor their reports. Furthermore, the press of the city has consistently refused to discuss the presentations they have made or the arguments they have brought forward. It is not remarkable that in so bitter, so long a struggle, the question as to which side one stands upon should become of more importance than the seeming issue at stake.

The issue at present is whether examination in subjects pursued outside the schoolroom should be made the means of testing the eligibility of a teacher to advance in salary. And this issue thus stated covers up unrecog-

¹ Some of the objections to the system were met by substituting for the examinations credits received in the extension classes of the Chicago Normal School, and from courses in degree-giving institutions, although it was not felt that this affected the principles at stake.

nized other issues which ought in all conscience to be brought to the surface. No one can decently question the statement that a teacher's efficiency ought to be tested by the success of her work in the schoolroom. Everyone has the right to have his capacity tested by his achievements. On the other hand, it is equally self-evident that no teacher can afford to abandon reading and study that goes beyond her routine work. But to deduce from these propositions either that examinations should or should not determine advancement in salary is a hopeless *non sequitur*.

The superintendent's interest in the examinations lies in the fact that these can be used as spurs to incite the teachers to study outside the schoolroom. The teachers' objection to examinations lies in their demand to be judged by their work, and their failure to find any relation between the outside study and their immediate vocation. They consider the examinations artificial and not germane to their teaching. It should be added that these criticisms are passed by the teachers of the Federation, and a number outside who sympathize with them, but that there is a considerable body of teachers who accept the system and are willing to be judged by it.

The conclusion that can be drawn from these premises is that a vital and organic connection should be found between the outside study of the teacher and her work in the schoolroom. There is no reason to believe that the intelligent teacher would be hostile to courses of study which she felt were assisting her where she recognized that her work was weak. It is the nature of any genuine workman to be grateful for assistance. Nor is it conceivable that the superintendent could do otherwise than welcome motives for study which should be more effective, and which would be free from the charge of artificiality that can be made against any system of mere examination.

This vital connection between study and schoolroom work is not far to seek. The methods of teaching all subjects in the curriculum is constantly changing, and we hope improving. The subject-matter itself is constantly growing in richness and interrelationship. The reading and studying that any teacher should carry on is demanded, not simply that she may keep from ossifying, but that she may keep up with the demands of her profession. Given libraries, the laboratories, the courses of lectures—in other words, the opportunities—and there is no limit to the amount of profitable work that would greet the teacher who would improve in her calling.

It is, however, equally necessary that the teacher should have competent guidance. Chicago has at present one superintendent and three assistant superintendents to keep track of 5,500 teachers. On the basis of the New York school system, Chicago should have at least sixteen assistant or associate superintendents. It is questionable whether New York has enough, but it is no wonder that Superintendent Cooley wishes a marking system for teachers which estimates them in percentages, however meaningless these percentages may be, that he may translate this vast number of human beings into numerical symbols. He cannot possibly deal with them in any other way.

The teachers themselves have not asked for such an increase of the staff of superintendents. They wish to be judged as to their efficiency by their principles. The demand is natural. The principal is constantly present and knows the whole situation with which the teacher has to contend. If the test were to be simply of general efficiency, one might be willing to rest the judgment with the principal, if he felt that the principal could be trusted to be impartial. The demand, however, which we have indicated for supplementary work by the teacher, has to do with the different phases of her work and calls for the judgment of experts in different fields of practical pedagogy. The average principal is not competent to criticize and direct the teacher in this supplementary work.

The superintendent of the Chicago schools should be surrounded by a faculty of men and women of the broadest training and experience, with varied specialties, who could come into the schoolroom, not as hostile and infrequent critics, but as recognized assistants of the teachers in their work and training, ready to point out defects only where they indicated means of correcting them. Such work would be related directly to the growth of efficiency in teaching, not to promotional examinations. Its relation to promotion, so far as it should have any, would be through its effects upon the teaching.

As the force of assistant superintendents has been diminished in the past, the superintendent has secured an increasingly centralized administration, and by this type of business management of what is not business, but pedagogy, has forced himself to reduce his teachers to percentages and his estimate of their personalities to examination marks. But what is most serious, his theory of examinations has provided the issue which has been responsible for the Teachers' Federation and its affiliation with organized labor. The Teachers' Federation came into existence to fight a battle; and not only is the system of promotional examinations not worth the fight, but it has obscured the real issue of the vital relation between teaching and the teacher's outside work, and the necessary conditions of such a vital relation.

The Merchants' Club of the City of Chicago showed its interest in the question by inviting a number of prominent educators to speak before them upon the school problems confronting the city. Among these men was President Nicolas Murray Butler, of Columbia University. It seems strange that President Butler should have declared that school administration is a business proposition pure and simple.

The business propositions with which a school board has to deal are the conditions of school administration; but, so long as this administration has as its ultimate end, neither the making nor the spending of money, but the development of the personalities of the children by means of the personalities of the teachers, such a statement is a distinct degradation of the function of the Board of Education.

Considering the position which President Butler has taken in the past,

notably in the report of the Committee of Fifteen, with reference to the position of the teacher in the school system, it seems still stranger that he should have announced that it is as absurd to speak of the democratization of the operation for appendicitis as of the democratization of the schools.

This amounts to saying that technical skill has reduced teaching to a mechanical operation; that, granted the technical skill of the teacher, we are called upon to consider his personality as little as we are that of the surgeon who uses the knife. The very perfection of surgery tends to make its operations highly mechanical. Every real advance in educational technique serves to make the process of education less mechanical, and the recognition of the personalities of children and teachers more profound and effective. It is just this recognition of the personalities of teachers and children, with all that it implies, which is meant by the democratization of the schools. It means that the Board of Education, its executive officers, and the community shall recognize that education is a social process, and not a mechanical art.

There is no social functionary who is more unfortunately isolated than the teacher in the schoolroom in our city schools. Above her stands the vast system of school administration giving her books and methods which she is to use; and before her stand the children who can receive the contents of the curriculum and be affected by the methods of the school only through her agency. There is no natural way in which she can react back upon the administration, by which she can make herself individually or collectively felt in the system of which she is the most important part. If she is a person and not simply a piece of machinery, there is certainly call for democratization of the schools.

It is here that we find a still more profound reason for the existence of the Teachers' Federation than that to which we have already referred. Until the teachers have as natural a method of expressing themselves within the school system which they must put in operation as a faculty in a university, there will exist the situation out of which irresponsible bodies like the Teachers' Federation will arise. It is immoral to demand that our teachers throw themselves heart and soul into the social activity of educating our children and then deny them any voice in criticizing, interpreting, fashioning the ways and means that they are to use. We can get the mechanical skill of army drill by mere discipline and acceptance of direction from above; we cannot get the moral relationship of persons by such means.

In a word, there are in the Chicago school system two evils, which must be held responsible for the existence of the Teachers' Federation and its affiliations. These are: a failure to provide a vital relation between the work in the schoolroom and that which the teacher should do outside—a failure which is responsible for this whole stupid wrangle over promotional examinations; and the entire absence in the administration of the schools of a natural way by which the teachers may express themselves, offer criticisms and suggestions with reference to the methods and books which they alone are

to use, and find that opportunity for voluntary identification with the methods and plans of the schools which alone can bring full moral responsibility.

It is certainly hopeful that Miss Jane Addams has secured the introduction into the report of the School Management Committee of free periods for teachers' study in the extension department of the city normal school; that Mr. Cooley has asked for three new assistant superintendents; and that the board may be counted upon to bring forward some plan for teachers' councils. All of these steps are movements in the right direction. They could be rendered still more rapid and definitive if the community could only recognize that this is at bottom a struggle over a real educational issue, and not a sordid wrangle between the externally organized teachers and the superintendent.

BOOK REVIEWS

A Brief English Grammar. By FRED NEWTON SCOTT and GERTRUDE BUCK.
Chicago: Scott, Foresman & Co., 1905. Pp. 197. \$0.60.

In the renascence of English studies in our schools, grammar has been neglected. The old books and methods were doubtless bad. An improvement was made when language lessons were substituted for the antiquated grammatical drill; but, so far as grammar itself was concerned, the results were negative. More recently, however, signs have been pointing toward a positive reform. Such a sign is the slender volume before us.

The names on the title-page raise expectations that are in the main fulfilled. The shortcomings of the book are on the purely philological side. The authors have caught the spirit of modern philology, but they occasionally are forgetful of linguistic principles and careless of linguistic evidence; they are not precisely "of lawe expert and curious."

After making the distinction of spoken and written language, the authors lapse into the old error of treating language as if it were *par excellence* written language. Phonetics is quite disregarded, as in ignoring the *s*-sound of inflectional *s* (p. 92 *et passim*), in distinguishing (p. 93) the "difficult" pronunciation of *ch-s*, *sh-s*, *x-s* from the "impossible" pronunciation of *s-s*, *ss-s*, *z-s*, and in not pointing out the unphonetic spelling of the plural *women* (p. 95). Comparative grammar is out of the question, but it seems unnecessary to block the way of it by stating from the point of view of modern English only what could as well—and more correctly—be stated from the point of view of comparative philology: thus "the inflection of adjectives [and adverbs] is called comparison" (p. 91). In fact, the statements that the subject of impersonal verbs is always the pronoun *it* (p. 55), that "with the direct object is sometimes associated an indirect object" (p. 57), and that the subject of the infinitive—a fiction of Latin grammar!—is in the objective case (pp. 136, 177), are hardly true even for English. The time-honored definition of the subjunctive, "thrice-battered" by Professor Hale, is twice repeated (pp. 91, 133, 152), and the definition of mood, as on p. 153, is even less defensible. The example set by Sweet of treating the tenses as states of action might well have been followed in a book that contains the admirable Appendix III on the passive verb. Historical grammar is similarly distorted here and there. The fact that *ought* (p. 138) was originally past is by itself without significance and even puzzling; why could not the preterito-presential origin of the auxiliaries have been given? In equating weak verbs with regular and strong with irregular the authors beg the question of regularity (pp. 139 ff.), and then inconsistently mingle strong and weak verbs in the list of irregular verbs in the appendix. To say (pp. 140 f.) that *fled* is made from *flee* by substituting *d* for the final *e*, and that *had* and *made* change the "consonant which is not final [of *have* and *make*] into *d*," is particularly naive. Plurals like *apparatus* and *series* (§ 83) belong properly in § 80, and the

statement that the apostrophe of the genitive indicates the omission of an *e* (p. 112) is quite unhistorical.

But no one can overlook the merits of the book. They are great; they are fundamental; they are positive. The arrangement is clear and illuminating. First sentence, then the complete subject, ditto predicate, the phrase, the clause; then, and not till then, the parts of speech; after this the *accidence*; finally syntax, not "false syntax," not arachnid syntax or catacombs syntax, but a brief, fresh, incisive account of important English idioms. Throughout the basis is sentence-analysis, and the emphasis is laid on function. The examples are unhackneyed and often taken in series from some school classic. The exercises are never mechanical or perfunctory. Everywhere is manifest an unerring instinct for what is essential and worth while. As a result of all this the student can never lose sight of the reasons for the study of grammar, or interest in the study itself.

The temper, too, is admirable. Nothing of Lindley Murray or Richard Grant White. Whatever the opinion expressed on any disputed usage, the manner of statement, the open-mindedness and tact, are most winning, and that in a subject where winning is of first-rate consequence. It is on this account especially that the book must be very frankly accepted as a genuine contribution to the pedagogy of English—and the pedagogical armory of textbooks.

GUIDO H. STEMPLE

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The Analysis of Racial Descent in Animals. By THOMAS H. MONTGOMERY, JR.
New York: Henry Holt & Co., 1906. Pp. xi+311. \$2.50.

Anything from the pen of a man as prominent and active in the zoölogical world as Professor Montgomery should command the attention of every teacher of biology. This large volume is a general and comprehensive work on the methods of determining racial descent in animals. The phenomena to be explained are numerous and complex, and therefore rather uncertain in results; but the consideration of them often leads to many of the broader concepts of biology. Some of the author's conclusions may indicate more clearly than anything else the extent and contents of the book.

He decides in the first chapter that "the sea beach from the regions of high tidal limit to a short distance below the low tidal is the probable point of origin of most animal groups." The second chapter treats of the germ plasm, the behavior of chromosomes, and the part they play in heredity. Farther on the author concludes that the male is morphologically and physiologically inferior to the female; that variation and mutation are instituted by stimulus of the environment; that transmutations are definitely directed and may be discontinuous by means of mutations, or continuous by means of variation; that certain kinds of acquired characters are inherited; that embryology does not furnish any recapitulation of the phylogeny, and an analysis of the stages during the life of one individual can in no way present a knowledge of its ancestry; that end stages in the ontogeny are more important than any other stages, leading to the conclusion

that the group Chordata is inadmissible because tunicates, Amphioxus, and vertebrates are very unlike in the adult condition; and that, just as one cell gives rise to others by division, so one organ produces others by division.

Every teacher and advanced student of biology should become acquainted with the views of an author who has studied so many and widely separated biological phenomena.

ROBERT W. HEGNER

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A Laboratory Course in Physics. By R. A. MILLIKAN and H. G. GALE. Boston: Ginn & Co., 1906. Pp. x+134.

This laboratory manual is intended to accompany Millikan & Gale's classroom text, *A First Course in Physics*, although it is stated that the manual may be used independently if desired. Directions are given for performing fifty-one experiments. Appendices give a suggested time-schedule for a one-year course in physics, and a list of the apparatus used together with the cost of the same. The experiments and apparatus are the outcome of three years' trial and improvement in high-school and university courses.

The book is of convenient size, clearly printed, and well supplied with illustrative diagrams. Many of the experiments are original and show a decided departure from those described in older texts. There is a well-defined attempt to simplify the methods and apparatus so that the pupil may grasp the physical principle without getting lost in manipulating details. Suggestive questions are inserted to help attain this object.

A possible objection to the proposed course lies in the introduction of the vernier and the micrometer caliper. The use of these instruments seems contrary to the authors' attempt to avoid the "creeping-over of the methods and the instruments of research and specialization from the university into the high school, where they have absolutely no place." The same objection might be urged against the use of per cent. errors and discussion of accuracy of measurements.

Altogether the book is to be commended, not only for its improvements over older manuals, but also as part of a *completed* and *tried* course. The fact that a complete set of apparatus for the course may be bought for a reasonable amount is an additional commendation.

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BOOKS RECEIVED

(The notice here given does not preclude the publishing of a comprehensive review.)

EDUCATION

Composition in the Elementary Schools. By JOSEPH S. TAYLOR. New York: A. S. Barnes & Co., 1906. Pp. 207.

Hints and Helps from Many School-rooms: Successful Plans and Devices Contributed by 150 Teachers Who Have Used Them in Their Schools.

